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NEW COMPUTER EXPRESS

BRITAIN'S BIGGEST SELLING COMPUTER WEEKLY

AMIGA

- F19 is on the way
- Pools predictor
- Heavy Metal review

ST

- 1040 bundle details
- Dan Dare III on test
- EPROM advance

PC

- Renderman coming
- Real 486/33 arrives
- Amstrad price cuts

CPC

- Turbo for Sprites
- Boxing action

CONSOLES

- EA pair for Megadrive

BBC•C64•MSX SPEC/SAM•QL XE•ARC•PCW

SPECIALIST COLUMNS

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Sales boom for hand-held machines as computers face summer leisure rival

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Strategy games for Sega Megadrive

This summer Electronic Arts will ship two award winning games as its first products for the 16-bit Sega Megadrive games machine – *Populous* and *Budokan*.

***Populous* was voted strategy game of the year by the Software Publishers Association and an American magazine called *Budokan* the IBM game of the year.**

The president of Electronic Arts, Trip Hawkins, said: "The market for these more advanced games is only just emerging, particularly for the Megadrive machine – the potential is enormous."

The Megadrive – known in the States as the Genesis – is the first 16-bit console for games, although a Nintendo 16-bit system is expected in Japan later in the year.

• Strategy games arrive for the consoles. PICTURE: CENTRESOFT

First trial for right-to-know law

DATA ACT IN COURT TEST

The much talked of Data Protection Act is finally being put to the test in the courts.

In what is believed to be the first civil action of its kind under the Data Protection Act, a 40-year-old Marlborough man, Neil Foster, is about to begin proceedings against the Home Office and Wiltshire police after he was wrongly arrested and charged with driving while disqualified.

Using incorrect information stored on their computer, the police had nabbed the wrong Neil Foster. As a result he lost his job, his car, his savings and was threatened with a prison sentence unless he could prove his innocence.

Some four months after turning amateur detective in a bid to track down the real Neil Foster, he found him living in Yeovil and was cleared.

Although cases such as this are rare, critics argue that the fact they occur at all is an indictment of the computerised police records system. Up to a million references a year are made to the computer for non-police matters such as security clearance.

The Data Protection Act was passed in 1984 and gives everyone the right to access and correct data held on them in a computer. For a fee of up to £10 any agency which holds files on you is obliged to give you a copy. For more information on your rights under the Data Protection Act contact the Registrar's office on 0625 535777.

• In next week's *Express* we will be running an interview with the Data Protection Registrar, Eric Howe, in which he goes on record as saying he wants an independent watchdog body to be set up to monitor data misuse.

Worm virus man gets off lightly

Robert T Morris, convicted in January of infecting thousands of US computers with his 'worm' virus, was sentenced to three years probation, $10,000 fine and 400 hours of community service.

The worm caused havoc for two days in 1988, attacking an estimated 6,000 Unix systems, some of them military computers.

He was the first person convicted under the recently-enacted federal Computer Fraud and Abuse Act, which carries possible sentences of up to five years in prison and a maximum $250,000 in fines.

Thomas Guidoboni, Morris's attorney, said: "The sentence was reasonable, but we're appealing for legal reasons. We are concerned that he is now a convicted felon."

US attorney, Frederick Scullin Jnr believed the sentence to be fair. He said: "This is sort of a unique circumstance. Don't feel that it's going to be any sort of precedent."

He added that future computer vandals could face stricter sentences.

Top graphics software converted to the PC

• Animations done with Renderman *have an almost photographic quality.*

***Renderman*, the software used by Oscar-winning animator John Lasseter, could soon be available on both PCs and Macs.**

Intergraph, creator of the second most popular CAD package *MicroStation*, has announced an agreement with Pixar of San Rafael, California, to develop interfaces between *Renderman* and *MicroStation PC* and *MicroStation Mac*.

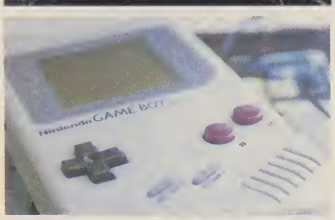
Lasseter uses *Renderman* on a Pixar Image Computer to produce his animations, which include the award-winning *Luxo Jnr* (about a baby desk lamp).

***Renderman* offers photorealistic imaging that defines visual attributes such as texture, reflected light and influence on shadows of light from multiple sources.**

There are already rumours that *Renderman* will also be available for the NeXT computer by the end of the year.

Britain scrambles to buy holiday games machines

HAND-HELDS ENJOY SUMMERTIME BOOM



• The Lynx (top) is selling as fast as Atari can make it, and the Gameboy (bottom) is heading for 5 million US sales.

Britain is all set to go games machine crazy this summer, with a rush for palm-tops that even the anticipated autumn console war – with four new machines expected – will be hard pressed to match.

While computers face a traditionally sluggish season in the shops, sales of the colour Lynx and mono Gameboy hand-held consoles are booming, with sales of single-game machines also reported to be rising fast.

Distributors have even begun to buy trade advertising space solely to warn shops not to be caught on the hop and sell out of palm-tops as demand rises to a peak over the summer holiday period.

Although an autumn console war was known to be on the cards – with Sega's Megadrive, the Amiga CD 'Baby', a CPC console and NEC's SuperGrafx all slated for launches around September – the rocketing market for palm-tops has caught the trade off balance.

Major distributor Silica Shop told *Express* that it was cleaned out of a batch of over 500 Lynxes within days of receiving them, and stated that "Atari has had to put them into full production to keep up with demand". Meanwhile the leisure division of Parkfield Communications announced that it had sold out of its initial stock of the machine before even receiving supplies, with more than half of the second consignment already accounted for in advance orders.

Only 4,000 Lynxes have been officially brought into the country to date – every one of them has been sold already – although unofficial imports have been selling for a couple of months. The machine does not even receive its public showcase until the June Atari Show, which will coincide with a national advertising campaign.

SOFTWARE BOOM

Lynx software support also looks set to boom – 90 authors were invited to a recent developers conference for the machine, but 120 turned up!

Atari appears to be revising its sales predictions for the Lynx almost daily. At the beginning of last week an internal Atari source revealed that the company anticipated turning over 60,000 units before next April; by Thursday an official spokesman was saying that Atari "will be quite happy with sales of 100,000". To put this in perspective, Atari has targeted 100,000 as this trading year's sales of the ST Discovery Pack.

The only factor likely to thwart massive sales of the Lynx is a shortage of components from third-party suppliers – it is thought that the miniature colour screens may be the problem. Atari expects demand to be far in excess of supply until the component shortfall is sorted out.

The Lynx will be far from alone in this potentially lucrative market. Azam Khan of retail and mail order outlet Shekhana, which has been importing both machines, says that he has been selling three of Nintendo's cheaper Gameboys for every Lynx shifted to date, and reckons that "the market is on the up and up".

Nintendo's US office last week confirmed to *Express* that the Gameboy will officially go on sale in Britain during August, and that a West German headquarters was being set up to cope with European demand.

The Gameboy sold a million units in the USA last Christmas at $89 each, and Nintendo expects to shift a staggering 5 million more this year. The company dominates the US console market, with the Nintendo Entertainment System now installed in 21 million households – that's one home in five.

Dedication's what you need...

Dedicated hand-helds are also enjoying the same rush of buyers as their multi-game counterparts. Hornby reports that sales of its six-machine £19.99 Konami range, which includes *Top Gun* and *Teenage Mutant Ninja Turtles*, are running at four times anticipated levels.

Richard Steele of distributor Centresoft, which supplies Acclaim, Grandstand and Game-and-Watch machines as well as Konami models, said that sales of hand-helds had actually risen every month since Christmas. "People like to take these games machines on holiday," he said, in explanation of the summer buying bonanza. "We've discovered that the biggest outlets are airports and motorway service stations – and, of course, the holiday resorts themselves."

Ash Taylor of Leisuresoft, which distributes a similar range, agreed with the general analysis. "This is definitely going to be a big year," he told us, "it's kicking off and we're geared up for it".

Amiga with 16 million colours

The Art Department, claimed to be the fastest image rendering and conversion technology available for the Amiga, is to be launched by ASDG – with an RRP of around £55.

An 8- and 24-bit image processing software package, *The Art Department* offers magazine-quality colour separations with 24 bitplanes (16,000,000 colours).

It is also said to be ideal for graphic and video artists using Amiga 3D modelling software because it converts 24-bit images to Amiga-displayable images faster than any other package on the market.

The Art Department was launched in America in April with a suggested retail price of $89.95 and is expected in the UK shortly.

• MicroProse's excellent F-19 flight simulator for the PC will be available by the end of June for the ST and Amiga. The original code, written in C, has been converted to machine code and the 3D graphics routines completely overhauled so that the game now runs at up to 20 frames per second - faster than on a 33MHz 386 PC!

With over 200 graphic objects, including 26 aircraft, the simulator puts the player in the cockpit of the infamous Stealth fighter on a limitless variety of missions with random weather conditions in Libya, Europe, the Persian Gulf and the North Pole.

As if this play area of over 400,000 square miles wasn't enough there are also new scenarios of Vietnam and Central America in the pipeline. The price is expected to be £29.99.

• Bushnell: joining the opposition.

Atari founder joins Commodore

Nolan Bushnell, the man who founded Atari, has joined Commodore as manager of computer interactive products.

When he sold his interest in Atari, Bushnell concentrated his efforts on toys, producing a range of 'Petsters' – including cuddly computerised cats – for Tomy.

• STE: bundled at last.

STE gets its own bundle

In a departure from the normal goodies to be found in the ubiquitous bundle, Atari's new 1040STE pack features only one game.

Curiously dubbed "The higher brain cell", the bundle offers both productivity and leisure software, with all the serious titles being supplied by veteran ST publisher Kuma.

The GEM-based *ST Word*, *ST Base*, *ST Calc* and *ST Graph* combine with First BASIC, *HyperPaint*, the adventure games creator *STAC* and Arc's *Prince* game to complete a bundle put together to 'empahasise the expandibility of the STE'.

After a recent unforeseen delay, the package will be available in two weeks' time for £499.

PC chip gets turbo boost

Intel's super-powerful PC chip the i486 has become even faster. The new i486 33MHz processor is Intel's fastest chip yet and has already found a home in a new NCR PC.

The new PC will run at 66 times the speed of the original 8088-based IBM PC, and continues the trend for doubling processing speed every 18 months or so.

•The i486 has 1.2 million transistors in it compared with only 29,000 in the original 8088 PC processor.

Papal Bull

Only weeks after Pope John Paul II warned about making technology an idol, the Vatican has shown faith in its own ability to avoid this idolatry by purchasing a Bull mainframe computer.

On his recent visit to Olivetti, the Pope said: "Man's pre-eminence over machines must be remembered." He warned decision-makers not to opt for technology for the sake of profits.

The Vatican has already installed Bull DP6s, PCs and a LAN in its most important centres and all the Vatican telephones, invoicing and warehousing are now computer controlled.

Macintosh-based system fights vehicle crime

POLICE COMPUTER IDENTIKIT FOR CARS

A computerised police identikit system for cars may help protect children from abduction and has won an award for excellence.

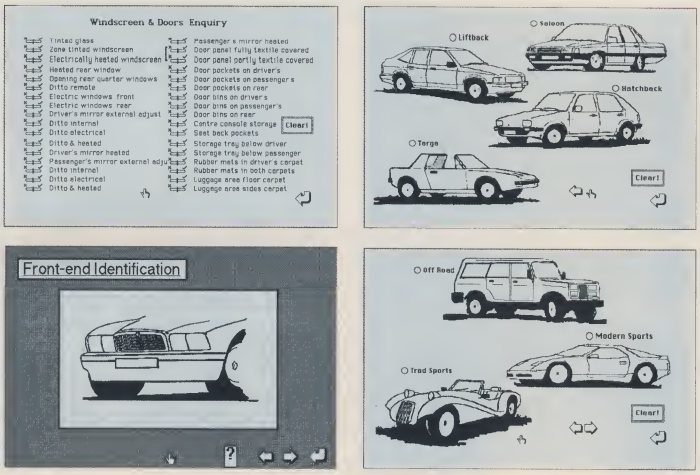
The *Motor Fit* project was the brainchild of Sergeant Simon Grantham of the Dorset Police, and won a special award in the recent *Apple Business* Excellence competition.

It was described by the judge as a way to save time, money, and most importantly, lives.

Sergeant Grantham saw the need for *Motor Fit* when he noticed that routine vehicle identification left a lot to be desired: "We were involved in a surveillance operation involving horrific offences against young children where the abductors waited near schools in the afternoon. We needed to identify the offender quickly, but were having difficulty identifying the vehicles involved."

A £23,000 Home Office grant set the wheels in motion, and with help from the motor industry and Southampton University Department of Psychology the project took shape.

Basic vehicle shapes are displayed to a witness and a series of simple decisions takes the screen display to the correct make and model, shown in the same aspect as it is remembered.



• By simply going through pages of choices like the ones above and clicking on the appropriate vehicles, Motor Fit establishes the model of car and then displays a full-colour picture.

Colours can be matched and, even if the information is slightly wrong, the target vehicle can still be found.

The system can cut at least an hour and a half from the time it previously took to identify cars, and, once identified, a poster can be produced for police officers to work from.

Motor Fit runs under *HyperCard* on a colour Apple Macintosh and the system is designed to match the human decision making process.

Sergeant Grantham explained the choice of computer: "We chose the Apple Mac for its friendly interface and the other uses that we could put it to."

See the world

Mindscape's £59.99 *World Atlas* for the PC provides instant access to over 240 EGA/VGA colour maps, and a mass of data on a variety of geographical topics.

Information on land use, climate, terrain, population, language and ethnic divisions is accessed through pull-down menus along with data on economy, communications, defence and travel.

Significantly, users can annotate the maps as the ASCII text files holding data can be loaded into a word processor for editing. As such, travel agents, teachers, students, librarians and executives will also be pleased to learn that menu options can also be altered to suit their own specific needs.

A CD-ROM based version for around £100 will also be available in June.

• Detailed and colourful maps from World Atlas.

BBs under fire for exporting secret codes

A narrow interpretation of US trade legislation could put hundreds of American bulletin board systems and their operators on the wrong side of the law.

It is illegal to disseminate certain encryption methods outside the United States, in particular the data encryption standard (DES). These are used in archive programs and thousands of BBs in the USA will almost certainly have at least one program containing encryption algorithms on file. Should one of these be accessed from abroad then, technically at least, this could be considered 'export'.

Phil Katz, who wrote *PKZip* using encryption technology, was not impressed by all the fuss.

"When *PKZip* was first launched we had two versions," he explained. "The 'domestic' version with encryption and an export version without encryption that we sent overseas. And all the domestic versions had a sticker on the package stating 'not for export'.

"We included export information in the documentation files to try and clear up some confusion that people had about *PKZip* in the past. What happened though, is everyone has 'freaked out' and become needlessly paranoid and hysterical – fearing that the National Security Agency is going to arrest every bulletin board in the country with *PKZip* posted on it."

Katz is now thinking about getting an export licence for *PKZip* because, although this might be costly, it will clear up, "all the needless hysteria". ■

'Operation Sun Devil' pounces on computer fraud

US SECRET SERVICE SEIZE DOZENS OF PCs

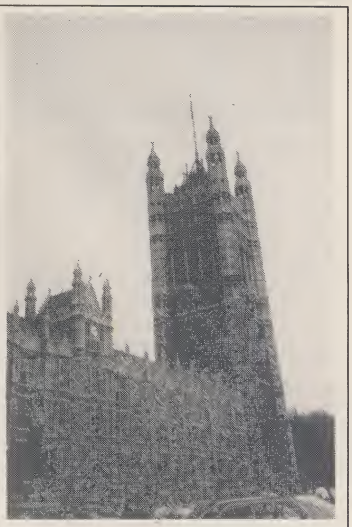
In a nationwide crackdown on computer intrusion and fraud last week, US Secret Service agents seized 42 computer systems and thousands of disks in an operation codenamed 'Operation Sun Devil'.

Around 150 agents operating in a dozen cities coast to coast targeted over 20 bulletin boards for alleged criminal activities, including unauthorised credit card use and alterations to medical and financial records.

The US Attorney General for the state of Arizona, Stephen McNamee, described the losses due to the credit card fraud as amounting to millions of dollars while a Federal Government spokesman described the operation as a response to "a crime wave in the computer area which is just astronomical. We can't keep up."

Under new US computer crime laws, investigations of electronic fraud are under the jurisdiction of the Secret Service. Defendants convicted of unauthorized use of 'access devices' such as credit card numbers and private long-distance phone codes can be sentenced to up to 10 years in prison if they commit fraud of more than $1,000.

A similar rash of computer credit card deception is believed to be at the centre of the recent 'Black Box' fraud involving British Telecom where 13 phone phreakers were arrested in dawn swoops (*Express passim*). ■



• *Bill goes to the Lords.*

Anti-hacking bill goes to the Lords

Michael Colvin's private member's bill designed to counter the boom in computer hacking progressed to its second reading in the House of Lords during the week.

An amendment to the police powers of entry clause was the only hiccup to the bill's otherwise smooth passage through its Commons report stage.

The amendment puts the onus on a judge rather than a magistrate to grant permission to search, and will be welcomed by civil liberties campaigners objecting to the bill's extension of police powers.

The Computer Misuse Bill will impose three levels of punishment to computer criminals. The basic offence will carry a jail sentence of up to three months and the penalties will be graduated up to a five-year jail sentence for premeditated damage and gain. ■

Speed king

In the computer world, bigger has never meant better – but single-minded can certainly mean faster.

Now the Japanese have unveiled computers designed specifically to model the gravitational forces within galaxies. Not only do these work at 120 million calculations a second (with a group linked in parallel approaching a staggering 1,000,000,000,000 calculations a second), but they cost far less than any comparable supercomputer.

The processor is called Grape (GRAvity PipE) and was developed by Tokyo University, the National Astronomical Observatory and Nobeyama Radio Observatory. Normal supercomputers, such as the Cray XMP/1, lose speed in order to maintain versatility. They can perform many tasks; Grape can only do one. But used with a host computer Grape can model the collapse of stars in the central regions of globular clusters – a task that would take a conventional computer a million years.

Grape's circuits have been wired so that it can cope with many calculations at the same time – with several streams of information flowing through at once.

Such a hardware accelerator is not, so far, of use to the kind of general computing undertaken on PCs. ■

'Attack of the killer micros'

Microcomputers designed to guide the US Star Wars project will make existing PCs obsolete within a couple of years, according to American scientists.

Two arrays of chips, each the size of a pack of cards, are each as powerful as over 300 current personal computers and were design to handle a simultaneous attack by hundreds of enemy missiles – examining them all, against the glare of the Earth's atmosphere, and deciding which ones are dangerous within a fraction of a second.

Dr John Provine, chief missile scientist at Eglin air-force base, Florida, stated: "I can see the day when home computers will be so compact that they will be virtually empty boxes."

Dr Eugene Brooks of the Lawrence Livermore Laboratories, California, was even more enthusiastic: "Nobody will survive the attack of the killer micros. This is going to happen a couple of years from now."

The new computers, one built by Texas Instruments, the other by Rockwell, weigh around 10 grammes and can perform 500 million operations a second – compared to 1.5 million per second for the average PC. ■

New Lotus 1-2-3

Version 3.1, the latest enhancement of *1-2-3*, combines traditional Lotus spreadsheet expertise with greater ease of use, the company claimed last week.

This will be achieved through an interactive graphical environment, improved memory management and support for DOS, OS/2 and the next version of Windows.

New capabilities include WYSIWYG display and printing, mouse support, adavanced worksheet formatting, text editing and graphic drawing tools and publishing quality output.

Lotus *1-2-3* 3.1 is due to start shipping in the autumn and will be priced from £475. Call 071-584 0122 for further information. ■

Fighting drug barons

Drug barons trading across Europe could soon be foiled by a computer based intelligence unit stretching across frontiers. The scheme was given the go-ahead by the EC summit at Dublin

The unit could set up a system of drug liaison officers in each of the EC capitals. The computer would enable data to be transferred across frontiers

The reason for these measures is the percieved threat from the South American cocaine producers that has already increased the need to co-operate across international boundaries. ■

No business like business show business

The North gets a share of the business glamour on May 22–24 when GMEx hosts the Computer North business computer show.

The three-day event covers all business needs and the large manufacturers are among the 110-plus exhibitors. Areas covered in depth include the buzzword of the moment, multimedia.

As well as stands and products, there is a series of free business computing seminars on subjects as wide ranging as accounting, desktop publishing, graphics and making information technology work.

More information from Marchia Ogden on 061-832 4242. ■

The news...

A digital dice kit from Maplin is designed for the absolute beginner. It combines a basic construction with the theory behind random number generation.

As most games have an element of chance, the electronic answer to the dice is a worthy project to start learning about circuits and logic. It costs £9.95 – ring 0702 554155.

▲ ▼ ▲

The Iraqis have caused the wires to buzz again with claims that they hacked into a Saudi Arabian Cray supercomputer.

While the Israelis, who can't buy a Cray themselves, used the Arabian computer, the Iraqis slipped in to do complex missile development calculations, claims the Israeli *Haaretz* newspaper.

▲ ▼ ▲

Daniel Brennan, a 17-year-old New York High School student has been arrested for hacking. If convicted he could be jailed for four years.

The authorities claim that he hacked into a saw manufacturer's computer using a toll-free phone number and altered data.

He was released to the custody of the Nassau County Probation Department and his computer, peripherals and software have been confiscated as evidence.

▲ ▼ ▲

Sandwich stock control will stop overworked fast food franchisers getting in a pickle. *Storekare* is a PC stock management system that can calculate cold cuts to the last shred of bread and count the cheese, salami and mayonnaise that's been used.

Instead of doing it daily or weekly, it can send a continuous record of what's going on so a supply depot would be able to anticipate orders more accurately. It works in a PC or PS/2 environment and will connect to IBM computerised tills. It is manufactured by Boca Ration Florida, and Unix and OS/2 versions are planned.

▲ ▼ ▲

A pocket computer that calculates the amount of daylight and darkness a body needs to recover after jet lag has been produced.

Air travel over long distances can expand or contract the day with the passing of time zones. This can confuse the body's hormonal system and cause lack of concentration and weariness.

The computer calculates the exact amount of exposure to daylight needed to re-adjust the body's circadian rhythms during and after long flights.

It costs £80 and should be available shortly. ■

...in brief

Ocean, Virgin, EA and US Gold head north

CHARITY SHOW HITS THE BIG TIME IN HULL

A northern charity computer show has twice moved to a larger venue as its theme, Compute for Charity, has caught the imagination of the computing industry.

Compute for Charity has attracted major industry supporters and exhibitors and takes over the Portobello Hall in Hull on the last weekend of June.

Ocean, Virgin Mastertronic, Electronic Arts, CodeMasters, Psygnosis, US Gold, Newtron and Goodman PD are just the first eight of a list that reads like the Royal Variety Performance of the computer world.

Compute for Charity will feature the launch of a new PC hardware range from Newtron, MIDI music forums including software, hardware and the Synclavier, and for those who like something bigger than a simulator, there will be a big red fire engine and police vehicles on hand.

The show combines the BBC Children in Need appeal, the Scout movement and handicapped children in its list of beneficiaries, and has the support of the computer industry and many more besides.

Organiser Andrew Whittaker was overwhelmed at the response from the 'big names' in the industry and said: "We started by simply trying to do our bit for worthy causes, and our infectious enthusiasm seems to have caught the imagination of everyone we've spoken to. We thought that we'd have to beg for support but companies are ringing us offering help and support."

Compute for Charity is on June 30 and July 1 at Portobello Hall, Holderness Lane, Hull. More details from Andrew Whittaker on 0482 564431. ■

• Some of the big names at the Hull show.

Smart card to foil car thieves

A smart card designed to replace the registration documents of a car has been developed by Argus, a group representing French insurers, and is already in use on the Continent.

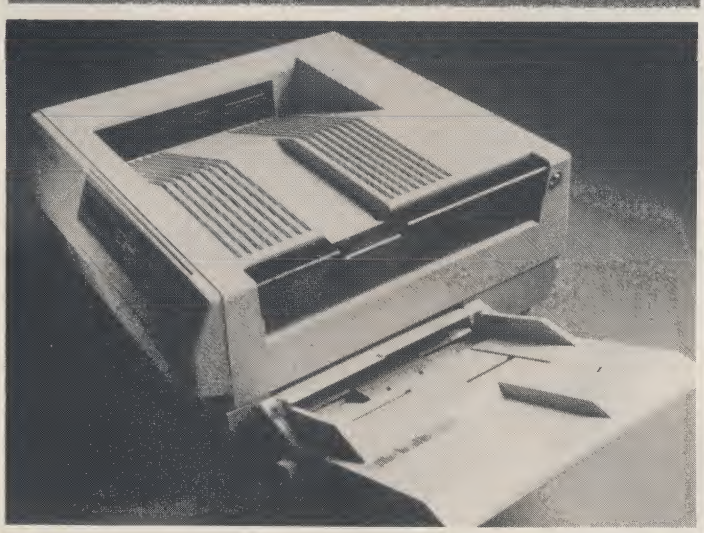
The card will help police and customs with the 250,000 cars that are stolen in France every year, 20 per cent of which are never recovered.

The Ivoir card has a 24K memory, and a semiconductor on it is programmed with the car's details. Details which don't change such as serial numbers are 'locked' in and things which can vary can be reprogrammed.

Scheme leader Alain Francottew said: "The most difficult part of the scheme was to convince everyone involved."

The card is available to French motorists for about £25. ■

LASER ON THE CHEAP



• The critically-acclaimed Epson GQ5000 laser printer is now available from ACS for £865 instead of the normal £1,300. The laser prints at six pages per minute and can scale its 13 built-in fonts up to 240pt. Although no PostScript graphics compatibility is built-in, the machine is ideal for high quality word-processing and DTP output. ACS is on 0800 333 333. ■

Lynx due at Atari show

Next month's Atari '90 show will see the official UK launch of the Lynx hand-held, a new 386SX PC and a range of financial, scientific, utility and games software for the Portfolio.

Amidst rumours – encouraged by the Atari camp – that Commodore is about to downgrade its business range to concentrate on promoting the Amiga worldwide, Atari is hoping to further increase its business profile, with the new 386SX launched at Hannover's CeBit adding to a sales performance already claimed to be 100 per cent up on last year's figures.

To coincide with the Lynx launch, Atari is exploring the possibility of running cinema advertisements of the American TV advert, banned by the IBA over here, which showed school kids playing truant to play Lynx games.

The Atari '90 show will be held at the Hammersmith Novotel in London from June 1 to 3. ■

Maplin mice

A three-button PC serial mouse and trackball have been introduced by component supplier Maplin.

The mouse comes with a 1.2m tail terminated in a 25-way D socket and costs £29.95. The £53.95 trackball features pop-up menu software that allows it to be used with programs that wouldn't normally be mouse driven.

More information on 0702 552911. ■

COMMENT

Will the hand-held boom just make life hell for train travellers, or do games machines provide a path to proper computing in later years?

It depends which side of the fence you sit whether you consider this year's boom in hand-held games machines and the anticipated autumn blitz of console launches a good thing or not.

What is there to be said against the trend? Some will feel that an extension of the quantity of games playing going on around Britain – particularly the wholly visible bogey-zapping on trains and buses – is likely to engender further anti-computer paranoia in the community at large.

A public already made anxious by the *QED* TV programme and other media hype about computer addiction may see hand-helds as a further sign of an insidious invasion of the electronic body snatchers.

And, of course, the 'my machine is more serious than yours' brigade will have a field day.

If Amiga and ST owners will find ample opportunity to sneer at games-only equipment, what apoplectic outbursts may be expected from those PC users who consider even the Macintosh as an article worthy only of derision?

HIDDEN MEANING

But is there any positive message to be drawn from this niche explosion? In the case of the hand-helds at least, we think that perhaps there is.

In the course of researching this week's lead story, we came across an interesting thought from Ash Taylor of the distributor Leisuresoft. "We can cater for people from young children to adults as part of a continuous process," he told our reporter.

"Hand-helds can appeal to children from the age of four upwards, and then we're into the console area, followed by computers like the ST and Amiga."

One may argue that ideally children should be started on a 'real' computer – Commodore's proposed junior education bundle for the Amiga will aim to expand this market – but the truth is that many parents will be reluctant to part with the money involved at a stage when there is no guarantee that their offspring will show a continuing interest in computers and computing.

If the £20 games machine really does represent the catch-'em-young link in a continuous chain, even as the ice-breaker to dispel parental technophobia, then its market success surely cannot be an entirely bad thing.

BOOM TIME

Whatever one's thoughts are on the matter, there is no doubt that the hand-helds boom is here (most of Atari Japan's 80,000 per month Lynx output will be shipped to Europe, for example), and distributors are almost universally predicting that the console craze set to start this September will not reach its peak until 1992.

While it may not please a small number of our more po-faced readers, *Express* will follow this trend with interest – not least to keep track of the associated technical innovation involved in these tiny machines.

In the next few weeks *Express* will be carrying an exclusive review of the Neo-Geo, the new Japanese console with 13 channels of CD quality sound and which runs at twice the speed of of an ST or Amiga.

And watch out for our mid-June three-page review of the current state of the UK console market, to be followed by regular updates of all that's new on the games machine scene. ■

FROM The ARCHIVE

ONE YEAR AGO

Acorn introduced its BBC-badged Acorn A3000. At £659 it had the advantages and operating system of the Archimedes but was enclosed in an Amiga-like case.

One year on, the A3000 forms the centre of 'The Learning Curve', a £799 Acorn educational bundle.

A sick right wing computer game was being played by Israeli youngsters in which the aim was to kill Palestinians.

The game called *Intifada* (uprising) had the player as an Israeli soldier fighting stone-throwing Palestinians on the Gaza Strip.

Gateway, the supermarket chain, got together with the Met Office to link its products to the weather. Buying habits change with the weather and Gateway used the *Datalog* program to feed patterns into its stock control system...

A hand-held pocket computer called Bene was announced. In it were all the details of state benefits and it allowed welfare workers to work out people's entitlement in a few seconds. It cost £76.50 and was capable of being updated as benefits changed.

Anti-hacking MP Emma Nicholson gave the police names of several Brits that she thought were involved in a spy school working for the KGB.

A report by the National Economic Development Office said that claims that the British public were afraid of technological development were a myth. The report said 87 per cent were in favour of home education through computers, but 63 per cent weren't keen on the idea of a robot maid.

Ocean's Hit Squad budget label appeared over the horizon with *Rambo, Enduro Racer* and *Daley Thompson* available and *Green Beret, Miami Vice* and *Yie Ar Kung Fu* bubbling under.

Sapphire international donated £2,000 to the NSPCC after raising the money at the *Which Computer? Show.* Visitors to its stand had a go at a competition and each entry represented a donation from Sapphire. The competition was won by Amstrad's David Marshall who won £2,500 worth of software.

TWO YEARS AGO

Market research firms confirmed that PC sales were running well ahead of the previous year although their figures declined to include Amstrad's stalwart PCW. The PCW can stand up for itself with over 500,000 units sold in the UK alone.

Comet took a serious shot at the low-end business PC market by including Amstrad PCs and portables on its shelves for the first time. These joined the PCWs and Z88s that Comet already stocked. and were earmarked for special store areas called Business World.

Rumours of a Spectrum Plus 4 at Amstrad were beginning to fray tempers. An Amstrad spokesman said: "I know nothing about the bloody Spectrum Plus 4. It's becoming the bane of my life." Two years later – and no Plus 4 – it seems that he was right.

The SAM Coupé was being promised by 'late autumn at the earliest' and the move from Cambridge to Swansea was being blamed for the delay. The Coupé eventually arrived late last year.

Sources: *New Computer Express, Computer Trade Weekly, MicroScope, Computer Talk.*

COMPUTER EXPRESS MEN

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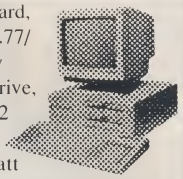

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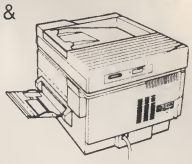

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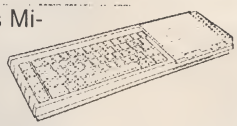

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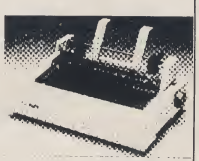

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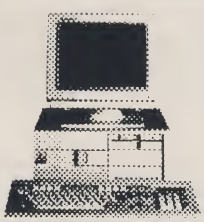

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CPC

HUNT FOR JUICY TIE-INS

The Hunt for Red October has already been a successful book, is currently a major film, having premiered in mid-April, and it's now going to be turned into a computer game – again.

That's right, Grandslam is re-releasing the title on the CPC, hoping to time it to coincide with the film's popularity peak later in the summer. The price will be £9.99.

In case you don't know the plot, it centres on a Soviet submarine's efforts to cross the Atlantic and defect to the West. In the film, Sean Connery, who plays the captain, is faced with the tricky task of getting there in one piece without his own side blowing him up for defecting or Western forces blowing him up for apparently attacking. Being a nuclear Russian sub, it might just blow up on its own, of course.

FASTER STILL

The release of *Sprites Alive* last year was great news for programmers, since it offered an extended BASIC designed specifically for games creation. Now the producer, Glenco Software, has come up with a new version – one with a built-in compiler – that will 'turbocharge' your software.

The speed gains you can expect will vary according to your *Sprites Alive* program, however. Ones which make great use of the special *Sprites Alive* commands won't necessarily run a lot faster because those commands work pretty efficiently anyway. But if your program uses a lot of ordinary BASIC, you can expect it to speed up considerably.

The addition of the compiler is not the last stage in the evolution of *Sprites Alive*, either. Glenco is currently considering another upgrade around next Christmas, this time with the addition of music creating routines. Other plans include the release of a compilation disk crammed with games written by *Sprites Alive* users.

In the meantime, the new compiler version of *Sprites Alive* costs £29.95, although owners of the original program can upgrade for a mere £7.50. Glenco is on 0642 606358.

CLAIM YOUR REWARD!

George Baxter, of Sevenoaks, has written in with a rather unusual request.

"Is there anyone among the readership of your great mag that has, or knows of, a program to simulate the movement of the continents?

"I want a program that starts with all the continents together in one land mass (Gondwanaland), then lets me input the number of millions of years I want – anything from one to 100 – which would be the movement 'steps' of the continents as they move apart up to the present day.

"Even better, it would be capable of going on past the position of the present day! I would be willing to pay for a good program – from £15 to £20. Sorry, I can't afford much more as I'm on Income Support.

"If there is someone who has, or can make, this sort of program, I don't want to offend them but I would like to try it first, to see if it is really what I want. I give to anyone reading this my honest guarantee that I will not make a copy of their program!

"Another program to get all you wizards busy would be to simulate the rising of the oceans of the world, from the world's oceans being non-existent (ie dry ocean floor) to the complete coverage of the world's land masses.

"Can anyone help with either or both of these suggestions? Write to me or phone any timse before 7-30 in the evenings. By the way, I have a CPC 6128 with colour monitor.

"George Baxter, 4 Chancel Close, West Kingsdown, Sevenoaks, Kent TN15 6UD. Tel: 0474 854224."

Well, George, I wish you luck, but that sounds like a pretty tall order to me. Half the geophysicists in the world would give their right arms for a computer model of the movement of the world's continental plates, and as for your second request, whoever wrote the program would have to devise a pretty clever map of the world which included contour profiles of all the various land masses. Mind you, on reflection, that doesn't sound quite as hard...

Rod Lawton

BOXING CLEVER

***World Championship Boxing Manager* sounds like a recipe for disaster at first. Take a one-dimensional all-action sport, take away the action, and what have you got? Well, thanks to Goliath – an insight into the tactical battles that go on outside the ring.**

You start off with a stable of four hopeful young fighters, and you must try to train them into young contenders capable of taking on the world champion – and winning. You need to keep an eye on the gym work and be canny when picking opponents and dividing the purse.

Even though *WCBM* is a management sim, there is action as well. During each fight, you're there at the ringside, patching up your man between rounds and giving him fresh instructions. In fact, *World Championship Boxing Manager* is one big pleasant surprise.

Graphics aren't quite as marvellous as claimed on the box, but they're not bad – you get to see how your fighter's doing between rounds by the state of his fizzog, for example.

***WCBM* is simple enough to play straight away, deep enough to keep you playing. And what's left? Oh yes, the price – £9.99 on cassette and £14.99 on disk.**

• Be watchful in the gym or lose your shoes.

BBC

GREEN BEANIE

Green is the colour not just of the moment, but also of this last decade of the 20th Century. And, by happy coincidence, it also happens to be the Acorn company colour.

Before you say, 'three cheers for Acorn', let us reflect upon the actual status of the computer industry with regard to green issues. And it is not good.

The actual semiconductor manufacturing process generates highly-poisonous, organic, mercury compounds as one of its waste products. Also, much of the world silicon-chip manufacturing capacity is in the far east where pollution control, worker safety and environmental concerns are low priority, to say the least.

Acorn, of course, claims to manufacture in the UK, which is partly true, because its machines are assembled in this country. But, as with most computers, almost all the chips used are sourced outside the UK.

Other materials used in computers include precious metals, which can be reclaimed, and plastics which generally cannot. So what can be done to ameliorate this state of affairs? The simple answer is to conserve your valuable resources that bit more.

For example, floppy disks are largely made of plastic which uses up valuable fossil fuel in manufacture and generates CO_2 (a greenhouse gas). The chances are that you, like me, have boxes full of rarely-used floppies gathering dust. If you reuse them, it will not only save you money, but conserve the Earth's resources as well.

If you have problems with removing the labels, you can buy bottles of proprietary label remover such as Texsolve from MBS (0925 820000) which costs about £5 and does not use ozone destroying aerosol gases.

MIXED FRUITS

If you were glued to the TV screen for Sir John Harvey-Jones' recent series *Troubleshooter*, you should also have compared his advice to Apricot and its subsequent action, with the current situation of Acorn. Basically, what he said was: "You are unable to keep your costs to the level of your competitors. Sell your manufacturing division before it makes you bankrupt", which did come about in the end.

Acorn, of course, has already been bought, but by Olivetti, which is another European company. Therefore, the question: 'Can Acorn keep its costs to the level of its competitors' must be asked and the answer has got to be: 'No, it can not. No chance'.

Acorn's profits are, by company standards, miniscule and, if you strip away the hype surrounding last year's financial results, you will see that the money coming in is hardly enough to finance new investment.

The inescapable conclusion is that Olivetti, which is a very large company, has a long term aim in mind. It could, of course, be the ARM technology, which is now beginning to appear as a high-performance graphics engine in some PCs, but that is small business. Look for more industry analysis next week.

Andrew Brown

YOUR FORMAT

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SPECTRUM

ON THE PLAIN

Just about the only country to embrace the Speccy quite as fondly as we did in Britain was good old Spain; remember that when they beat us at football.

Their top Spectrum software house is called Dinamic and over the years, it has churned out some excellent games like *Freddy Hardest* and *Army Moves*. The thing all its games had had in common is a stratospherically high difficulty level and a learning curve that is more like a vertical line.

Anyway the newest product – *Astro Marine Corps* – looks really good. It's a multi-level shoot-'em-up with exploration overtones, and it includes some good looking graphics that explode and fly around the screen in glorious Technicolor. I strongly suggest you watch out for the review in *Your Sinclair*.

IN SEARCH OF MICRODRIVE

In a display of Speccy-owning comradeship that I've come to expect from you lot by now, I have recently received details concerning the long sought location of those rare, mystic relics, Microdrive cartridges.

This find should please James Taylor of Manchester whose cartridge-less plight I recently publicised in this column. A Oliver of Port Talbot very kindly wrote in to say you can still obtain the elusive things from Boots of all places and added that if James cannot get them in Manchester he "would gladly try to get some for him".

What a generous chap! If James wants to take him up on the offer all he needs do is write to me and I'll pass on the relevant details.

The equally wonderful human being that is JPS Pennycook of Lincolnshire let me have his entire address book of cartridge suppliers.

Some of the cheaper outlets he mentioned were: Sector Software (Unit 13, Centurion Way Industrial Estate, Farington, Leyland, Lancs PR5 2GU) who sell single cartridges for £1.90 or batches of five for £9.50; and Kobrahsoft, (Pleasant View, Hulme Lane, Hulme, Nr Longton, Stoke-On-Trent, Staffs ST3 5BH) who will provide your microdrive with magnetic sustenance for £8.50 (five cartridges) or £1.70 per single cartridge if you order a minimum of four.

Finally, JPS mentioned a Microdrive cartridge baron by the name of Joe Atkinson (36 Ranelagh Road, Ealing, London W5 5RJ) who will supply your Microdriving needs for £1.50 per cartridge (plus £1 p&p if order is below £15) and can let you have five of the things in one go for £7.50.

With all those possible suppliers of the damned things no one has got any excuse to be without a Microdrive cartridge or four. Many thanks to both A Oliver and JPS Pennycook for aiding fellow Speccy owners.

CHEATING GOING ON

I'm forever indebted – well for a few days anyway – to Ronni Sterling of Glasgow who's supplied me with another large batch of cheats for you this issue. Thanks to Ronni, infinite lives and similar everlasting benefits are just a few complicated pieces of keyboard yoga away.

- *Ghosts 'n' Ghouls* – When in play, press Enter for invincibility
- *Bedlam* – Hold down Caps Shift and D. Your ship can move about while all else remains stationary.

Also, dig out that old joystick you got free with your 128K Speccy and define the player one controls as Sinclair 1 and player 2 keys as 9-up, 8-down, 6-left, 7-right and 0-fire.

Then, while you're playing, hold joystick down and left until one ship is exactly on top of the other. Now move out and you'll have supersonic speed.

- *Iron Soldier* – type GAD.
- *Task Force* – Define keys as CRASH.
- *Cobra Force* – Define keys as SIMON.

Robin Alway

SAM COUPE

IT HAS ARRIVED!

Lerm Software, – highly respected in Speccy utility circles, squares and other geometrical shapes – have come up with two impressive looking pieces of software exclusively for SAM.

The first is SAM Assembler which, you shouldn't be too surprised to hear, is an assembler, based on Lerm's acclaimed Z80 Toolkit program. It features an easy-to-use full-screen editor, block delete, hex/decimal/binary input formats and everything else you'd expect to find in an assembler worthy of the tag.

Lerm claims compatibility with the Coupé whatever changes are made to the ROM, and if you intend doing any serious programming with your SAM this is probably going to be essential.

Lerm's other package for the Sam is *SAMTape*, which is actually two programs designed to make transfer of your Speccy programs to Coupé disk as painless an experience as possible. It does this by converting your SAM into a Spectrum with a Multiface and allows you to halt programs with the NMI button and then save to disk, insert some pokes and do all those other fun things you used to get up to in your old Speccy-using days.

The package's other program converts the layout of the Coupé keyboard into one resembling the Speccy which makes using BASIC Speccy programs possible on the SAM.

SAM Assembler and *SAMTape* both cost only £8.99 each and with Lerm's commitment to updates and user support look like being important packages in the Coupé's development. Contact Lerm at 11 Beaconsfield Close, Whitley Bay, Tyne and Wear NE25 9UW: send an SAE for details.

Robin Alway

PCW

PD FILE

What is public domain, asks James Satchell of London. It's a notional area where people put software they've written so that anyone can take a copy of it for free.

Whereas making a copy of, say, *LocoScript 2* and giving it to a friend is illegal, you are not only allowed to make a copy of *VDO2* (a *WordStar*-like word processor in the public domain) and give it to friends, but are encouraged to do just that.

People put their stuff in the PD for the pleasure of spreading about something they've written – one of the positive sides of the still largely amateur nature of computing.

There are all sorts of PD programs available: word processors, databases, games, utilities such as word counters for *LocoScript*, exotic things like biorhythm predictors – the quality varies from excellent to dreadful, and sometimes programs converted for the PCW from other CP/M machines fail to work totally. But what have you got to lose? It's all good fun.

Advantage (0242 224340, fax 226755) is one outfit specialising in PD. For a small copying charge (usually £6, which includes the price of the disk) you can get a variety of PD software: a video collection database, home insurance utility, font creator, comms utilities, STD codebook, mathematical toolbox, word processor, spreadsheet, database, trivia quiz, chess, adventure games...

TIME IS MONEY

Don't waste time watching a *LocoScript* document print out when you could be editing another one!

On the PCW you can print a file while editing another ('background printing'). While editing your file, press the [f7] key (in *Loco 2*, [f1]) and then select the 'Disk management' menu option.

The editing screen will vanish and you will see the same file directory screen that you see when you aren't editing a file.

Now you can print, move and delete other files in the normal way, though they have to be on the same disk. To get back to your edit, press [EXIT].

NO BALLS

Michael Wood of Chiswick is cricket fan and wonders what software there is for the PCW.

There are two scorer's programs that calculate averages for a tenner (try *Averages* from 88 Abingdon Rd, Drayton, Abingdon OX14 4HT, or *Spartan* from 29 Feltham Ave, East Molesley, Surrey KT8 9BJ). There's also a game, *Graham Gooch's Test Cricket*, which you may find for £20 or less in mail order, or from 0734 303663.

AMAZING BUT TRUE

In 1987 Kent police enlisted the help of the magazine *8000 Plus* to catch a drug smuggler. He'd been using *Money Manager Plus* to keep his accounts and on arrest had tried to wipe the data from the disk with a greasy finger. It didn't work. The data was recovered and he was convicted.

Rob Ainsley

MSX

A LITTLE CROW

When you are writing a column about a range of computers like the MSX, you find that it is virtually impossible to know all the features of the various machines. It therefore came as no surprise when a dedicated MSX user rang me to tell me that the Sanyo computer, as mentioned a few weeks ago (*Express* 77), does in fact have an expansion port as well as a cartridge slot.

Now, the Sanyo port and the Toshiba port are very similar – in fact they use the same type of connector. This socket is configured in exactly the same way as the cartridge slot and many Toshiba owners will remember an adapter that allows cartridges to be attached here.

Unfortunately Sanyo, in its wisdom, wired this socket in a mirror image of the Toshiba's connector and the adapter cannot be used, unless you wish to convert or create a lead of your own.

THE REVIEW THAT IS

I was going to review *Laser Squad* by Blade Software weeks ago, but it has taken me ages to figure out the game – so, better late than never – here are my impressions of the game.

The MSX version has lost none of its playability in conversion. It is strange that once in a while a game is produced that does not include stunning graphics, only has average sound and has an instruction book thick enough to discourage most hardened players from even trying the game, yet it somehow has that factor we call playability. *Laser Squad* is such a game, combining strategy, skill and playability in such a way that anyone who likes a challenge cannot fail to get hooked.

Briefly, the game is a one or two player tactical combat game that lets you and your opponent place and move your respective units (troops) – victory points being awarded each time your forces defeat the opposition.

The first one to reach 100 points wins the game. The game is far too involved to describe in detail and it is not a game that you can immediately get into, reading the manual while you are playing seems the order of the day.

At £9.99 for hours of enjoyment, expecially in two player mode, *Laser Squad* is certainly one of the best games to appear on the MSX this year.

BARGAINS GALORE

Anyone out there looking for a bargain? Of course you are. John Mathews has written and he tells me that he has purchased all the MSX stock from a store in London. He can now offer this stock, which includes Toshiba HX/22 computers and HX 550 printers at £74 and £95. Also included in his list were wordpros like *Bank Street Writer* for £15 and Computersmate's *Secretary* for £35 – both of course on ROM.

If you wish to see the full list of what is available, send an SAE to John Mathews, 61 Oak Hill Crescent, Woodford Green, Essex IG8 9PR. Thanks to John for thinking of other MSX users and for reading the best MSX column in the country. (Of course it's the best – it's the only MSX column in the country!)

Keith Neal

C64

DOWN UNDER

If any of you would like to combine business with pleasure and discuss adventure games with an Australian lady who can offer help on hundreds of the beasts and who is feeling somewhat left out of the worldwide adventure scheme of things, then why not write to Mrs Dorothy Millard?

She resides at 13 Venetian Cresent, Croydon, Victoria 3136, Australia. I'm sure she would appreciate return postage as well.

I never knew that Australia could also boast a Croydon...but then you can't ever get too much of a good thing.

Or, perhaps duplicating a good thing makes two good things, which is a double positive, which itself in some cases is seen as a negative by certain Aboriginal peoples of Australia – or so I am informed at any rate.

MAPS FOR SALE

I know that it isn't so long since I last mentioned the adventure fanzine *Spellbreaker!*, but since that last mention the good people have set up a new service which might be of interest to quite a few of you.

As well as offering solutions to adventures for sale at the rather inexpensive price of 30 pence, they are now offering maps as well – at the same price – for those of us whose artistic talents fall woefully short of drawing the things properly.

You know the sort of problem. You start in the middle of the page and end up with everything crammed over on one side while the other side of the sheet of paper remains devoid of print.

Anyway, for details of these offers and, in particular, which adventures are available, write to the editor, Mike Brailsford at 19 Napier Place, South Parks, Glenrothes, Fife KY6 1DX.

Also, you may write to Mike, enclosing £1.50 for a sample issue of *Spellbreaker!*. And then all you have to do is sit back and wait.

Pete Gerrard

FREE FREE FREE

Many of you must have dabbled with the Freescape system from Incentive Software, the first example of which was the marvellous *Driller*, closely followed by the almost equally marvellous *Dark Side*.

Trouble with *Dark Side*? Here's a few pokes for you to dabble with after loading the game and resetting the computer:

- `POKE 26272,173:POKE 29005,173` **for unlimited time.**
- `POKE 24891,173:POKE 28671,173` **for unlimited fuel.**
- `POKE 26193,173:POKE 26221,173:POKE 29337,173:POKE 19013,173:POKE 29328,173` **for unlimited shields.**

QL

MULTIBASIC

The latest version (1.7) of Minerva, the popular QDOS replacement developed by the QView International Megacorporation, includes a multi-tasking SuperBASIC interpreter – probably the first time this has been done, anywhere.

Multi-tasking BASIC was part of the original QL specification, but Sinclair never got round to implementing it. Stuart McKnight of QView told me that one of the development team has had 119 programs running on a system with expanded memory!

Of course, the programs executing are not actual QDOS jobs, so one can't switch between them with Control-C, as one can with compiled programs.

Knowing that Sincalir used a VAX super-mini to develop QDOS and SuperBASIC, I was intrigued to hear that Minerva was developed on a QL, albeit with a 30Mb Miracle hard disk. The GST macro assembler was used. Minerva comprises some 300 source code modules – quite a lot of code.

Over 500 copies of Minerva have been sold, while the total advertising spend has been a mere £40 for a page in *Quanta*!

TECHIES ONLY

One can build a library of object modules – Sinclair re-locatable binary format – merely by concatenating the different files. I've only seen this mentioned in one publication: the linker section of the GST macro assembler documentation.

All compilers and assemblers that use the GST linker generate suitable files. You can write a simple SuperBASIC program to perform the concatenation (this was how I tested the idea), and a suitable program written in C appears as an example in the MetaComCo QL C documentation.

Incidentally, there are several 'features' in MetaComCo's QL C. MetaComCo circulated a list of them, but they were never fixed.

For instance, register variables don't work, and the compiler generates a warning if 'return' doesn't have an argument. If you are compiling a large program and you get an 'out of memory' error, even in a 640K machine, try allocating more memory with a `"%workspace"` (I generally use `%100000`) command line specifier. This works with both passes of the compiler, but isn't mentioned in the manual. An alternative, of course, is to split a large program into modules, with one or two functions in each module.

MORE GROUPS

Several QL users belonging to the Chorley Computer Club are interested in forming a QL section. The contact is Keith Reading, 50 Howkshead Avenue, Euxton, Chorley, Lancashire: You may phone 02572 77482.

And anyone interested in joining a Surrey group, contact Tony Gordon on 0372 58180 or leave a message on the Qualsoft BBS (071-706 2379).

John Torofex

XE

LIES, DAMNED LIES AND...

Statistics are a necessary part of everyday life – especialy if that life involves the manipulation of any kind of values and figures.

You've already got a business graphics package and spreadsheet to calculate and display – prettily – the possible areas of expenditure at the end of the fiscal year, but unless you can decide just who buys most, you'll have nothing to spend.

Statistics from Atari is a simple to use stats package that enables you to enter raw data and which then provides a complete range of statistical analysis reports. Simple calculations such as the mean and standard deviation are handled with ease, but it's also possible to perform mode, kurtosis, variance and skew tests as well as root mean square.

The package is equipped with printing options so you can get hard copy of all those important figures and if you have extended memory such as the 128K offered by the 130XE machine, *Statistics* supports that too, enabling an enormous amount of data to input into the program.

There's a very friendly user 'front-end' so that even the complete stats novice will be using, inputting and editing information quickly and easily and getting the most from the benefits Statistics has on offer.

At the miniscule sum of £4.95, *Statistics* is an analysis package you simply can't afford to miss.

Edmund Blake

ARCHIMEDES

CARNIVOROUS CAVERNS

I seem to be reviewing a game a week at the moment, which must say something about the Archimedes scene.

Caverns, from Minerva Systems begins to show what the Arc can do graphically. It's similar in some ways to *Oids* or *Rotor* in that you guide a ship through a series of caves collecting bits and pieces and depositing them in other places. In the process, you also have to destroy a bewildering array of defence systems and pick up and use tools like lengths of rope and poles.

You don't get told how to use any of the implements, nor what to do with the various artifacts distributed around the caverns – that's part of the fun.

What you do get is a large, three dimensional ship which changes aspect as it rotates – all very flash. You also get excellent effects from explosions and the jetstream of your motor.

The sight of your own ship exploding is particularly impressive – a host of oddly-shaped bits of debris scatter the immediate surroundings.

Unfortunately, you get to see rather a lot of that particular explosion. Control of your ship is via the keyboard with rotation, thrust, fire and pick up/put down on the expected keys, but unlike the aforementioned *Rotor*, everything happens rather too fast.

The ship is awkward to control and the game starts hard and gets harder, rather than having progressive levels of difficulty. There doesn't seem to be any way of improving the handling of your ship other than hours of practice. Some of the tunnels are very tight and gravity is strong from the start.

All in all, *Caverns* is well thought out and excellently implemented on a graphics basis. Sound is fairly minimal, but it's the gameplay that really needs adjustment. It's fine if you're a seasoned pilot, but there's no easy way in for the anyone who might be an acolyte.

PIPP AT THE POST

Cambridge International Software, based in London, has a new product on the stocks which should aid primary school teachers greatly in coping with the intricacies of the National Curriculum (NC).

The Primary Integrated Project Planner (PIPP) is designed for teachers who work through class projects but need to fulfill the topics and statements made in the NC.

The program acts as a resource database with a keyword search system. If the teacher wants to plan a project on 'colours', say, he or she can enter that word, or any related words (eg rainbow, prism, dye) and PIPP will search through its database, pulling out all the NC topics that include these words.

The teacher can then go through the list and check off the topics covered as the project progresses. What the program is effectively doing is combining intrinsically different ways of working, itself one of the major sources of extra work in implementing the NC in the nation's primary schools.

Although not quite ready yet, PIPP promises to be a great aid in curriculum planning and will retail for around £40 – which is uncommonly reasonable.

The program has been produced by two practising teachers, who have planned a range of pre-designed projects to use with PIPP – if extra inspiration is needed. These will probably retail at around £20.

Cambridge International is also considering marketing projects from other users of the package, once it's launched. Further information is available from CIS on 071-833 4023.

Bertrum Carrot

ARCHIMEDES FAIR

There's been a recent growth in Archimedes and BBC Micro 'fairs', usually under the auspices of one of the leading dealers.

An Arc-only fair is now planned for London on June 16 and 17 (Saturday and Sunday). This will take place at the Central Tutorial College, 8 Herbrand St, London WC1.

Many of the names in Archimedes software will be there, including Minerva, EMR, Superior Software, DABS Press, Archive and CIS.

Unlike some of the other, dealer-based, fairs, exhibitors will be able to sell their own products rather than having to channel them through the host.

WINDOWS 3 BIG HOPE

Microsoft is due to release version 3.0 of its graphic windowing environment, Windows, on May 22. It promises much, and may well extend the life of DOS by several years. Unlike current versions of Windows, Windows 3 is full of graphic icons and is much more like Presentation Manager in appearance. This is no coincidence, as Microsoft and IBM would like to see users migrating from a 'low-end' Windows environment to OS/2 with PM, as their needs develop.

'Low-end' is a relative term, though, as Windows 3 will need a fairly powerful machine to do it credit. A 286 will probably be a minimum realistic platform for the new software, with a 386 preferable. Memory and processor prices are dropping all the time, so this may not be too much of a problem.

Windows 3 offers a number of advantages over the existing product, as it will bypass the 640K memory limit (on a 386) and treat all RAM up to 16Mb as contiguous memory. It will also create virtual memory, treating an area of hard disk space as RAM and handling four times more memory than the machine actually has.

There is a question-mark over compatibility of existing Windows applications and Windows 3, but unlike Presentation Manager and OS/2, which still has very few dedicated applications, there is a lot of third party software under development for Windows 3. It's quite likely that new versions of *PageMaker*, *Excel*, *Word*, *Ventura Publisher* and *Corel Draw* will be announced at or soon after the upcoming Microsoft launch.

LASER LABELS

A few more goodies picked at random from the new products available at the *Which Computer?* Show last month. You may remember I was getting gummed up over laser printer labels a couple of months back.

Well, taktik labels would seem to be just the ticket, as they're purpose designed for use with laser printers. These labels have paper surrounds and a high strength adhesive to ensure that they peel off onto your envelopes rather than onto the laser's drum.

They come in a variety of sizes on A4 sheets and should be available from most business PC dealers. If your dealer hasn't heard of taktik, get him/her to ring Samuel Jones & Co on 0480 75351.

LASER REFILLS

The cost of an HP or Canon laser printer cartridge is typically £60. The alternatives are to buy an unbranded cartridge, of dubious origin, or to have it refilled. The most common method of refilling a laser cartridge is to 'drill and fill'. As the name suggests, this simply means drilling a hole in the casing of the cartridge and squirting in fresh toner.

One London-based company offers a rather more extensive service, though. Laserfill can now provide a 'leasehold' toner cartridge; in other words, they can offer to independently replace any part of the cartridge – toner, photosensitive drum, corona, etc. As your cartridge runs out, the necessary parts are replaced and the unit returned to you within 24 hours. The toner is of higher quality than most used by original equipment manufacturers (OEMs).

The whole service is available for £42 per cartridge, or less on contract. This is not only a cheaper way of dealing with laser printer maintenance, it harks back to the first item this week. Replacing the components which fail is environmentally much sounder than junking the whole thing.

At the moment, Laserfill can only handle Canon based-engines – as used on the HP, Canon and Star machine among others. Before the end of the year, though, it hopes to extend the service to TEC, Kyocera, Ricoh and Qume engines. Laserfill is on 071-359 7679.

BIG BLUE GOES GREEN

In an increasingly environment-conscious world, computer companies have not been in the forefront of green manufacturing. The main culprit has been chlorofluorocarbons (CFCs) used for cleaning printed circuit boards. These have a very detrimental effect on the ozone layer, but also a polluting effect if they 'escape' from hazardous waste dumps, either on land or sea.

It's therefore a very good sign and a feather in IBM's cap that the company has a strong environmental policy and has just completed a change from CFC to water-based cleaning at its main UK manufacturing plant in Greenock. It cost IBM £1.8m to develop an alternative cleaning agent which could still ensure the quality standards it needs for its PCB manufacture.

This move makes the Greenock site totally CFC free, but is only one step on the trail to total CFC-free manufacture throughout the world. IBM aims to achieve this by 1993, a full seven years ahead of the target date set internationally by the Helsinki Accord.

REMOTE CONTROL

One of the most useful pieces of software to come out in the last year is a comms utility which lets me ring in to *PC Plus*'s modem. The magazine's PC – a rather tired PC 1512 – then rings me back and lets me control its inner functions or send files to it down the modem.

This same technique is ideal for business reps ringing back to base for ordering information, technical support engineers, who can operate their customers machines without having to visit them, or any system where remote control can save time or money.

A new product, not the one *PC Plus* uses, was available on the Megatech stand at the *Which Computer?* show. *CO/Session* 4.0 claims to be the fastest remote software package on the market, with screen updates up to 400 per cent faster and file transfers up to 20 per cent faster than its competitors. It supports all screen modes, modem speeds from 300 to 57,600 baud and runs as a TSR – you call it when you want it.

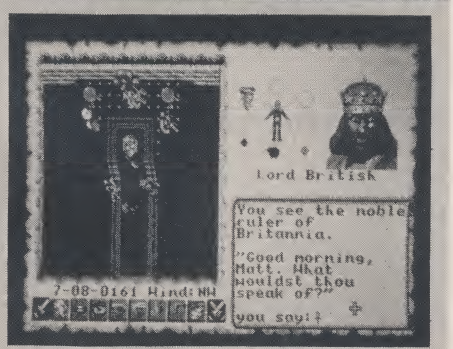
The package costs £99.95 for a single user system, or £199.95 for a two PC pack. Contact Megatech on 081-874 6511 for more details.

Simon Williams

ULTIMA VI

PC GAME of the WEEK

Origin • £34.99



Like a book, a computer game succeeds by its ability to make you forget about the mechanics of computer screen and keyboard, and be drawn into the imaginary world created by its author.

One of the most complex worlds created for the computer to date is that of Richard Garriott – or Lord British as he is otherwise known.

Lord British is also his alter ego in the world of Ultima, a series of role playing games he started 10 years ago and now on its sixth part. This Lord British is the benevolent ruler of the kingdom of Britannia, ruling from its capital city, Britain.

You play his friend from another world (our world) who can be summoned at times of need, this time to overcome the mysterious Gargoyles who have been invading and taking over Britannia's places of worship.

The game starts in British's palace, after three old friends have rescued you from a gruesome death.

In true role-playing tradition you then explore Britannia and the Underworld beneath as a group, collecting objects and powers as you go.

Over the years Britannia has become more and intricate, until now it is almost awesome in its scope. *Ultima VI* is the first in the series to make full use of VGA graphics, so everything is far more colourful. Unfortunately the authors have gone a little too far colouring icons, so that you frequently find yourself bogged down working out which icon is which rather than enjoying the game.

It is very difficult to evaluate whether something like this is going to live up to its promise in such a short review, but *Ultima V* certainly delivered the goods and at the moment *Ultima VI* looks like it could keep you involved for a very long time.

Matt Nicholson

ELONEX 486

Elonex, the London-based PC company, seems to be doing a Peugeot and going from strength to strength. It's latest creation, though, is definitely in the 'Cor, did you see that Maserati – only six of those made a month, you know?' class; it's a 33MHz 80486 tower. Fast or what?

Based on the company's 25MHz design, which includes some cunning caché memory and ultra fast hard drive controllers, the PC 486/33 incorporates eight slots, six of which are to the EISA standard, up to 32Mb of memory on board and drives a lot of hard disk with pseudo access times down to 0.4ms.

What all this high-techery amounts to is one of the fastest PCs around. The other noteworthy thing to add is that the base price starts at around £5,500. Sounds a lot, but then you're getting something with the power of a super-mini, and you don't get many of those for a grand – though you'd get quite a few PC 486/33s for the price of the Maserati. Elonex is on 081-965 3225.

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Konix Speedking Joystick	£11.95	For 40 3.5" Disks	£8.95
Red Mouse Mat with Amiga logo	£5.95	Amiga 1/2 Meg Expansion	£99.95
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Contriver Amiga and ST Mouse with FREE Holder and Mouse Pad £20.95

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AMIGA

GAMBLER'S DELIGHT

Computers can be a gambler's best friend. Already we've seen news items in both *Express* and the national press concerning gamblers who have used their computers to help them make it big from horse racing, the pools, and so on.

Although using a computer for such purposes cannot guarantee to make you a million (I lost a fiver on the Grand National because I listened to what my Amiga predicted), the machines can provide invaluable assistance when sorting through the mountain of statistics that are involved with such pastimes.

TAM Marketing, headed by programmer and all-round famously nice guy Steve Marriot, should be a familiar name to Amiga-owning gamblers. Steve's last product, *The Tipster*, helped many Amiga owners make a few pence at the expense of the bookies. After recently completing the Apricot X1 version of *The Tipster*, Steve has now made a return to the Amiga with the release of *The Punter* – a Pools program.

The Punter is a sophisticated pools predictor that uses many of the algorithms that made *The Tipster* such a winner. The theory behind *The Punter* is that if a person is rigid in their selections (ie goes by the same set of rules) he or she will stand a higher chance of winning.

The Punter causes you to slow down and become more involved with each line of the pools coupon. If you follow the rates that the computer will output for each team, your chances of winning should increase considerably.

Like all gambling, *The Punter* is only a guide. As Steve would say: 'If in doubt, use your own judgement'. For more information on *The Punter*, give TAM a call on 0392 215485.

IN THE LIMELITE

Future Software Systems of Maidenhead in Berkshire (home of Commodore) has released *LimeLite Professional*, a unique 'Video Typewriter' aimed at the desktop video, point-of-sale user who requires a quick and easy method of producing professional-looking presentations.

LimeLite Professional combines simple text editing features with exceptionally dramatic text presentation options – ambient graphics and scheduling of text, pictures and animations for presentations of all kinds.

Features include full menu-driven operation, full on-line help facilities, support for Amiga IFF graphics and animations, 20 pre-programmed video effects, 12 present modes including scroll, crawl and page, etc. *LimeLite Pro* is available from the good people at Future Software Systems; phone 0628 24318.

LOVE THY EDITOR

As the old saying goes, a programmer's best friend is their text editor (surely you've heard that one). Forget how fast your assembler assembles and your compiler compiles, if your working environment isn't up to scratch, you'll never be able to work at full efficiency.

Text editors for the Amiga have never really been anything particularly special. PC users moving over to the Amiga after using editors such as *Brief* are often dismayed by the poor quality of such tools. However, there is one exception – *Cygnus Ed Professional* from CygnusSoft in the USA.

After nearly two years at the top, Cygnus now has released a successor to its state-of-the-art editor with the release of *Cygnus Ed Professional*, version 2. Thanks to ASDG in the States, I've been using *Cygnus Ed 2* for about a week now and I can safely say that I am absolutely, completely blown away by this powerful piece of software.

No other text editor on any machine even comes close to the power and smoothness of operation that *Cygnus Ed 2* provides. If you're serious about your Amiga programming, you've got to be serious about your text editor.

So what is it about *Cygnus Ed 2* that makes computer journalists flip their lids? As well as the usual features that you'd expect from a top-of-the-range text editor (multiple documents, search and replace, cut, copy and paste, etc), *Cygnus Ed 2* includes a new Turbo-Replace mode that operates 100 times faster than the original (and even that was damned quick), full support for A-Rexx (roll on WB 2.0), comprehensive macro facilities and much more besides. Words alone cannot describe the power of *Cygnus Ed*.

With *Cygnus Ed 2*, not only do you get a damned good text editor, but this latest release includes a complete Intuition Requester library with colour and font requesters, and a whole host of intuition gadget management tools.

The best news of all is that this requester library is freely distributable and can be called from just about any programming language that you care to mention. Full Include and Documentation files are distributed on the *Cygnus Ed* program disk.

If my little rantings haven't convinced you of the power of *Cygnus Ed Pro*, then perhaps you'll be more convinced when I say that fellow users of *Cygnus Ed 2* include a certain Jay Miner and R J Mical.

Jason Holborn

PLAYING TIP

GHOULS 'N' GHOSTS

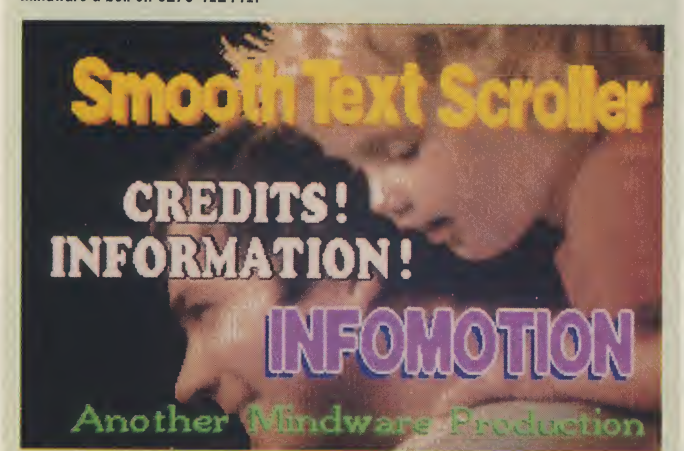
The ST cheat gives a bit of a clue to Amiga fans. Instead of typing the name of the programmer, type the name of his relative Karen Broadhurst, and you will be invincible.
Mike Edwards, North London

VIDEO VISUALS

Mindware International/GEM has announced the release of *Credit Text Scroller*, an easy-to-use package designed for the production of smooth-scrolling text screens for desktop video applications.

Utilizing a simple point and click interface, the user can select fonts, font sizes and scroll rates. After producing the text to be scrolled within your favourite word processor, just let *Credit Text Scroller* create your credit screen which is then automatically saved out in standard IFF ANIM format.

For professional video work, the smooth-scrolling results can be genlocked over an external video source, or overlaid onto another animation. Just like Zuma's *TV*Text*, *Credit Text Scroller* automatically generates additional colours and drop shadows to standard Amiga bitmapped fonts. For even more juicy snippets about this wondrous program, give Mindware a bell on 0279 412441.



• The latest from Mindware is smoothness incarnate.

AMIGA GAME of the WEEK

HEAVY METAL

US Gold • £24.99

Rather than going for a simulation of a particular piece of military hardware, US Gold has decided to produce a game combining elements of no less than three army attack vehicles. *Heavy Metal* places you in the controlling position of an army troop consisting of Main Battle Tanks (MBTs), Fast Attack Vehicles (FAVs) and Air Defence Anti-Tank guns (ADAT).

To begin with you must enter a combat simulator, where your skills at controlling each of the three vehicles will be tested. If you manage to reach a qualifying score, then you may enter the tactical section of the game. This involves deploying four units of troops across a battlefield in an attempt to stop the enemy forces from reaching your HQ. Each unit has its own properties that will come in useful in different situations.

The MBT is the toughest of the vehicles, being heavily armoured against attack. The vehicle is controlled by two crew – a driver and a gunner. The driver manoeuvres the tank across the combat zone while the gunner uses the laser targetting to home in and destroy enemy targets.

The FAV is a speedy jeep-like vehicle with a top-mounted cannon. The principal use is for penetrating enemy areas and destroying as many pieces of hardware as possible before the enemy can catch it.

The ADAT combines a laser-guided missile system with a 30mm cannon mounted on a tank chassis. Used primarily as a first line of defence, the ADAT can take out enemy aircraft and tanks at quite a distance, but is rather slow moving and therefore makes an easy target.

You must master all three systems to try and conquer the enemy troops, otherwise the General will not be entirely pleased!

To begin with, *Heavy Metal* seems to be a simple 'blast' game that just happens to have three sections, as each of the simulations wouldn't really stand up in its own right. Once the tactical element is brought into play, however, the three elements fit together rather nicely, forming a playable strategy/action game.

***Heavy Metal* is the right thing to bridge the gap between wargaming and arcade action, allowing fans of either genre to try a little of the other. In the final analysis then, *Heavy Metal* is an enjoyable venture, with enough action to keep everyone as happy as little clams.**

Maff Evans

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Technology Centre

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PANASONIC	KXP 1081	144/28	122
PANASONIC	KXP 1180	192/36	139
MAN. TALLY	MT 81	130/26	107
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PC 1640 DD	581	677	773
PC 1640 HD30	773	869	966

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8088; 4.77/7.16/9.54mhz; 640K ram; 3 slots; serial/parallel ports; clock; 1 or 2 360K drives; MS DOS 4.01; GW basic and manuals.

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PC 10	SD	494	629	649	736
PC 10	DD	551	690	707	795
PC 20	HD20	675	799	846	929

(As PC 10 SD but includes hard disk drive)

80286; 6/8/12mhz; 1mb ram; 3 slots; serial/parallel ports; clock; 1x 1.44mb drive; MS DOS 4.01; GW basic and manuals.

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SPC 3000/1 SD	410	519
SPC 3000/2 DD	473	581
SPC 3000/3 HD20	676	784

80286; 8/12mhz; 1mb ram (exp. to 5mb); 5 slots; serial/parallel ports; clock; 1x 1.2mb & 1x 1.44mb drives; MS DOS 3.3; GW basic and manuals.

	VGA £
SPC 6512/1 DD	1029
SPC 6512/2 DD HD20	1306

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MONO	SAMSUNG	MA 2671/3/5 FST	12"	81
MONO	AKHTER	MONO 14 FST	14"	79
MONO VGA	PHILIPS	BM 7749 FST	12" p/w	107
MONO VGA	AKHTER	VGA 14M FST	12" p/w	99
MONO VGA	SAMSUNG	ML 2611	12" p/w	81
MONO VGA	SAMSUNG	ML 4571	14" p/w	95
MONO A4	SAMSUNG	MP 5671(inc. card & drivers)		634
CGA	PHILIPS	CM 8833	14"	209
EGA	PHILIPS	CM 9073	14"	289
EGA	SAMSUNG	CM 4551	14"	281
VGA	HYUNDAI	HDM 401 FST	14"	253
VGA	PHILIPS	3CM 9809	14"	372
VGA	SAMSUNG	CJ 4581	14"	281
VGA	AKHTER	VGA 14	14"	273
MULTISYNC	SAMSUNG	CT 4581	14"	340
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NEW EPROM PROGRAMMER

Remember the days of 8-bit cassette loading, hanging around for entire weekends for a game or a word processor to load on your Speccy, CPC or C64? Remember the amazement of your first disk-drive? And then came the ultimate – the speed and convenience of a hard disk?

Gradually you tire of the time it takes for your word processor to load. Why can't it be instant, you wonder? Well, it can – if you have an EPROM programmer. What you do is plug the device into the cartridge port on your ST, 'burn' or copy your required programs onto a chip, and then, next time you switch on, your word processor or whatever is there will come up automatically – no loading, no waiting!

Now Lakmeyer is introducing an EPROM programmer that can handle the latest 32-pin 4Mb chips. Two pieces of software are included: EPROM engineer provides copying, editing and relocation facilities, while Silicon Disk effectively transforms the unit into a hyper-fast disk drive of 120 or 500K capacity.

Lakmeyer also offers a ROMdrive providing 1Mb of virtually instant ROM storage. It is a WORM drive (Write Once, Read Many times) – except that erasure is possible with ultra violet light. The ROMdrive – without EPROMs – is £45, while the 4Mb EPROM programmer is £270. Further details from Sinclare on 081-316 1779.

ADVENTURE SNIPPETS

Atlantis Software has released the ST version of *Dungeons, Amethysts, Alchemists 'n' Everythin'* (recommended for over-16s). I've seen advance packaging, and anyone who thinks the word 'humorous' has an 'e' in it should consult a dictionary a little more often.

The ST version of *The Third Courier* is out from Accolade, the company that is working on *Gunboat*, a military river combat simulation. Also out very soon is *Elvira, Mistress of the Dark* from Horrorsoft. You may well have seen the advance publicity for this one already, since it features the extraordinary Elvira herself, who apparently thinks she's a size 12 and is out by a considerable amount, as it were.

Finally, courtesy of Interceptor, there's *Galdregon's Domain*, a classic icon-driven role-playing game that puts you on the search of the five gems of Zator.

Thanks to Henry Mueller of the Adventurer's Club (071-794 1261) for the above snippets. If you're into ST adventuring, give him a ring or write to: 64c Menelik Rd, London NW2 3RH.

THE HUNT

Last year Grandslam had some success with the ST version of the cold war thriller *The Hunt for Red October*. In the wake of the success of the film, starring dear old Sean Connery (and I do mean dear – and old), the game is being re-released at £14.49.

But it doesn't stop there. Oh dearie me no. For the computer version of the film of the book is already well under way, due for launch, according to Grandslam, "in late summer when the film's popularity is probably at its peak." In fact the movie has done top dollar in the states, suggesting either that the Americans miss the good ole days when the only good Ruskie was a dead Ruskie; or, alternatively, that the cold war thriller is already beginning to acquire a certain romantic nostalgia.

Whatever, Grandslam must be delighted with an opportunity to take a second bite of the cherry. More details of the game as I hear them.

ST TOP 10

I should have known better, of course. Trust me to ask you lot to come up with an ST Top 10. What do I get? I get replies like the one from Gary Hawtin of Crawley in West Sussex.

Serves him jolly well right: I'm sending him a copy of US Gold's appallingly addictive *E-Motion*, in which Gary will spend the next few months knocking his balls together...

I'll spare you the full grotesque glory of Gary's chart, but it includes such gems as 'Smooth Operator' by Sade (whatever happened to her, I wonder?), 'I Can't Go for That (Amiga)' from Hall and Oates and 'Slip Slidin' Away (Amiga)' by the very, um, *short* Paul Simon.

Come on people, you can do better than that, can't you? Address your Top 10 to ST Top 10, Steve Carey, 30 Monmouth St, Bath BA2 2AP. There's another super software mystery prize for anyone who can better Gary's effort.

ROMBO'S ART'S NOT IN IT

A brief footnote to the review of ST art packages that appeared in *Express* a few weeks ago. John Nutall of Farnham in Surrey has written in to point out that one of them, *ZZ Rough* from Rombo Productions on 0506 414631, is not in fact available separately, but can only be bought when you purchase *Vidi ST*, Rombo's digitiser.

Indeed you're right, John. I'm told by Rombo that the company has only licensed the French program for sale with the digitiser. That's a pity, because although *ZZ Rough* is a quirky package and is eccentric in some of its ways, it's well worth the £20 price tag – if only you could buy it at that price!

CALLING ALL PIRATES

Colin Hunt, who edits the newsletter of the Bournemouth Atari User Group, tells me that somehow his name and phone number have been used in a magazine advertisement for copying games. He's been plagued by calls from people asking him about his pirating service.

"The thing is," Colin tells me, "I spent a long time cleaning out the Group. And I don't want anything at all to do with this kind of thing. Can you stop it?" Well, I can try. So if you have seen the ad in question, I'd be grateful if you could get in touch with me, Steve Carey on 0225 442244.

Steve Carey

NEW ST MOUSE

The only people who could possibly like the clumsy and sluggish mouse that comes with the ST are those who invented it or make money from it. Users hate it.

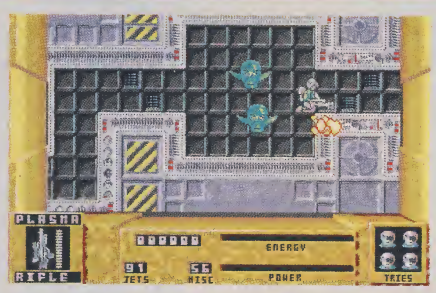
That's why there's a steady trickle of replacements for the darned thing. Latest are the snappily titled 820 and 830 from relatively new peripheral producer Contriver. Costing £29.99, both offer a not-bad 200 dpi (in other words, moving the move an inch transfers the cursor by 200 pixels on screen). No clues are offered as to the difference between the two mice, except that they 'have a different appearance' (or look different, as you and I might say).

And if you haven't got yourself a copy of *Quantum Paint*, just about the standard ST art package, you can pick up both it and a mouse for £49.99. How? By ringing Contriver on 0280 822805.

One last note: Is Contriver so called because of its publicity material, which depicts a mouse being molested by a cat? I'm just looking forward to the time when the company does a RAM upgrade, showing a goat climbing a hill, or an unpopulated board featuring an empty surfboard, or...

ST GAME of the WEEK

DAN DARE III



Virgin Mastertronic • £19.99

It's the 40th anniversary of Dan Dare and as a celebration of this event, Virgin has just released the third in the series of Dan Dare games. The first was a typical adventure game but these last two are multi-directional scrolling action games where the emphasis is on fast and furious blasting.

The game begins with Dan trapped by the evil Treens. After knocking them unconscious he escapes, finds a jet-pack and shoots off towards the hangar. Here he discovers a ship, but it has no fuel. The objective is therefore to search the Treen empire for enough fuel to fill the ship's tank and then blast into space.

Using the jet-pack you can fly around the Treen stores to collect additional weapons. All manner of weapons are on offer from homing missiles and bouncing bombs to energy shields and the occasional nuclear device.

The game is divided into a series of multi-directional scrolling stages and at the end of these you confront a large end-of-level guardian. These can be either large Treens or gun stations.

When you successfully destroy the enemy you can pick up a pod and this gives you access to other levels when you take to a large transporter.

In the later levels the guardians can be found sitting in front of the fuel cannisters. Since each cannister contains 10 pounds of rocket fuel, they are of vital importance to your mission. If you can kill the guardian and pick up 50 units of rocket fuel you can rush back to the stores and climb aboard your ship.

The main playing sprites have failed to capture much of the excitement of the comic strip. The characters aren't composed of quite enough frames of animation to appear realistic, which is a great shame becuse it's small details like this which could have made it a great hit. As it is, there is a place for it.

In fact, if you are bored by *Blood Money* and Silkworm, then *Dan Dare III* is definitely for you.

It's a game aimed at the shoot-'em-up addict with levels which are incredibly tough from the very beginning.

Mark Higham

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AMIGA HARDWARE

Amiga 500 + Batman Pack & 5 games, joystick £345.00
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AMIGA BATMAN PACK £317

New from Amiga
Includes: TV modulator, 3.5" Disk Drive with Amiga DOS Kickstart, Workbench and Batman The Movie game, F18 Inceptor, Paint 2, New Zealand Story.

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Inc. database, spreadsheet, WP, music, art & design, logo and BBC emulator.

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Mannesman Serial Interface £49

REPAIRS FOR AMIGA AND ATARI

AMSTRAD PCW

● STOP PRESS
Database • 051-357 2961
£49.99

A well-designed desktop publisher which doubles up as a graphics package. Besides being able to display data as graphs, pie charts etc, and manipulate draw objects, there's also a zoom feature, image superimposition and a clip art library. You can print up to 108 pages in one go, choose from 14 different fonts and use up to 96 point type size.

▲ Great graphics handling
▲ Accurate positioning and layout

▼ Poor facility to undo mistakes.

Value for money ★★★★★

AMSTRAD CPC

● STOP PRESS
Database • 051-357 2961
£49.99

The DTP package for the CPC, *Stop Press* allows you to produce text of any size with a wide range of fonts and run it around illustrations you've drawn and edited. You can make fine adjustments, add patterned borders, create boxes, add shaded backgrounds and even fill circles with text.

▲ An impressive and comprehensive all-rounder
▲ Fantastic text and graphics handling

▼ You need a mouse

Value for money ★★★★★

COMMODORE 64

● STOP PRESS
£39.99
See notes above

BBC

● WAPPING EDITOR
Watford Electronics • 0923 37774
£69

Coming on a 64K ROM, this package has a sophisticated graphics module, prototypesetting software, a word processor, font editor and a variety of printer dumps. It's mouse control allows you to create pages from A6 to A3, and print up to 150 characters across a A4 page. Multiple columns and pages are also supported.

▲ Very user friendly
▲ Extremely comprehensive range of features

Value for money ★★★★★

PC GRAPHICS

● PC PAINTBRUSH
Microsoft • 0734 500741
£145

Bitmapped painting package which offers a reasonable range of tools and functions to build impressive graphical displays. This program allows you to perform everything from simple sketches to complex and colourful designs.

▲ Microsoft is synonymous with quality
▲ Moderately easy to use

▼ Not cheap

Value for money ★★★

● DELUXE PAINT II
Electronic Arts • 0753 46465
£99.95

Comprehensive painting program also available for other machines which features functions such as dithering, lots of fills, stencils, in fact everything necessary for the budding silicon artist.

▲ Comprehensive and fully featured
▲ Gets the most from the limited PC display

Value for money ★★★★

● CORELDRAW!
CTRL ALT DELI • 0908 662759
£460

Advanced paint program with many functions including full traced bit-mapped graphics, lots of colours and fills and an easy to learn user interface. If you have a yen to tinker with paint and design but don't want to learn complex command sequences this is for you.

▲ Easy to learn and use
▲ Bit mapped graphics

Value for money ★

● VP GRAPHICS PLUS
Paperback Software • 0245 265017
£114.95

Not a paint package as such but rather a program which allows you the user to produce graphs and charts depicting a variety of information. You can draw histograms, pie charts, line graphs in fact everything necessary for business graphics display.

▲ Full range of charts available
▲ Easy to use

▼ Not for artists

Value for money ★★★

AMIGA GRAPHICS

● DELUXE PAINT III
Electronic Arts • 0753 46465
£79.95

The painting package for the Commodore Amiga. All possible functions including dithering, patterned fills, stencils, use of perspective, rotate and scaling effects as well as wrap fills, shadow painting using EHB and last but not least incredible animation making full use of all available tools.

▲ All possible painting functions
▲ Powerful animation

▼ A little daunting

Value for money ★★★★

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REPAIRS FOR AMIGA AND ATARI

AMSTRAD PCW

● STOP PRESS
Database • 051-357 2961
£49.99

A well-designed desktop publisher which doubles up as a graphics package. Besides being able to display data as graphs, pie charts etc, and manipulate draw objects, there's also a zoom feature, image superimposition and a clip art library. You can print up to 108 pages in one go, choose from 14 different fonts and use up to 96 point type size.

▲ Great graphics handling
▲ Accurate positioning and layout

▼ Poor facility to undo mistakes.

Value for money ★★★★★

AMSTRAD CPC

● STOP PRESS
Database • 051-357 2961
£49.99

The DTP package for the CPC, *Stop Press* allows you to produce text of any size with a wide range of fonts and run it around illustrations you've drawn and edited. You can make fine adjustments, add patterned borders, create boxes, add shaded backgrounds and even fill circles with text.

▲ An impressive and comprehensive all-rounder
▲ Fantastic text and graphics handling

▼ You need a mouse

Value for money ★★★★★

COMMODORE 64

● STOP PRESS
£39.99
See notes above

BBC

● WAPPING EDITOR
Watford Electronics • 0923 37774
£69

Coming on a 64K ROM, this package has a sophisticated graphics module, prototypesetting software, a word processor, font editor and a variety of printer dumps. It's mouse control allows you to create pages from A6 to A3, and print up to 150 characters across a A4 page. Multiple columns and pages are also supported.

▲ Very user friendly
▲ Extremely comprehensive range of features

Value for money ★★★★★

PC GRAPHICS

● PC PAINTBRUSH
Microsoft • 0734 500741
£145

Bitmapped painting package which offers a reasonable range of tools and functions to build impressive graphical displays. This program allows you to perform everything from simple sketches to complex and colourful designs.

▲ Microsoft is synonymous with quality
▲ Moderately easy to use

▼ Not cheap

Value for money ★★★

● DELUXE PAINT II
Electronic Arts • 0753 46465
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● PHOTON PAINT 2

Microillusions • 0480 49497
£79.95

This is the package for the novice. A very easy to use painting program that is both powerful yet simple to learn and exploit. There's full use of HAM modes, airbrush, texture mapping, variable blend control and animation. Recommended.

▲ Easy to use
▲ Many functions including animation

Value for money ★★★★

● PROFESSIONAL DRAW

HB Marketing • 0895 444433
£155

For those who want to create professional designs this is the package. Professional Draw has an easy to understand user interface featuring many icons which relate well to their respective operations making it easy to get the most from the program.

▲ Structured approach simplifies operations
▲ Reasonably priced for professional quality CAD

▼ Requires a little draughting knowledge to get the most from the program

Value for money ★★★

● DIGIPAINT V3.00

HB Marketing • 0895 444433
£60

The original and still one of the best. Fully-featured HAM painting package with sexy functions such as 4,096 colours on-screen and lots of special effects including shading, blending and tinting. What's more this latest version also features text, overscan and texture mapping and is £20 cheaper than earlier versions.

▲ Plenty of features for the money
▲ Special effects tools

▼ Not the most comprehensive paint package

Value for money ★★★★

ATARI ST GRAPHICS

● CYBER PAINT

Electric Distribution • 0480 496666
£69.95

Breath-taking bitmapped animation and graphics package from American magazine/software publisher Antic. This program features some incredible effects including tweening (changing one object to another a line at a time) and very powerful animation functions. Rivals the Amiga and is highly recommended.

▲ Very powerful animation
▲ Stunning effects
▲ Cheap

Value for money ★★★★★

● DEGAS ELITE

Electronic Arts • 0753 46546
£24.95

Like *Digipaint* for the Amiga, Degas *Elite* was one of the very first painting programs available for the Atari and it's still one of the best. You can have up to eight word screens at once cut and paste between any of them and there are plenty of useful and powerful functions such as zoom, block handling etc.

▲ 8 screens available
▲ Powerful block handling

▼ Lacking in features when compared to latest offerings

Value for money ★★★

● SPECTRUM 512

Electric Distribution • 0480 496666
£59.95

Painting package featuring (as its name suggests) 512 colours. The program is simple to use and effective. There's some very powerful functions too in the form of anti aliasing and gradient fill.

▲ Lots of colours
▲ Easy to use

▼ A little expensive

Value for money ★★

● ADVANCED ART STUDIO

Rainbird • 071-240 8838
£22.95

Aimed at those with a serious interest in producing quality art/graphics displays. The Advanced Art Studio has an enormous range of fills as well as comprehensive zoom and text handling complete this package.

▲ Lots of fills
▲ Powerful manipulation tools

Value for money ★★★★

ARCHIE GRAPHICS

● ATELIER

Minerva Software • 0392 437756
£99.95

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Value for money ★★★

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- ST ADVENTURES PACK System 5, Once A King, Darkness Is Forever.
- EDUCATION AND FUN Junior Publisher, Graphics, Music, Numbers, Go-Round (Maths), Number Maze, Geography.
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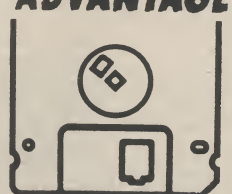

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Based on the industry standard, *Pagemaker*, frame-based documents can be picked up moved off page and re-pasted at will and at ease. Supporting text flow, zooms, handy drawing utilities and high-resolution bitmapped graphics, *PP* also offers colour separation control – all at an amazingly low price. There's a page review mode and PostScript printing is also catered for.

▲ Excellent value for money
▲ Perfect for high-resolution pages and colour separation

▼ Needs two drives or a hard disk

Value for money ★★★★★

● PAGESTREAM

Silica Systems • 081-309 1111
£171.35

A frame based package, which also uniquely allows you to rotate text and graphics material in three dimensions. Aside from the usual DTP features, page view, variable zooms, automatic text wraps, and a range of text styles make the product very comprehensive.

▲ A wide range of flexible control
▲ Unique 3D text and graphics handling

▼ Limited colour separation

Value for money ★★★★★

● CITY DESK

Precision Software • 081-330 7166
£157

A different approach offers the user a column-based formatting package in which imported text can be shunted around the page as if it were a graphic object but font, sizing and style attributes are messy. A rather simplistic graphic editor does it business adequately enough but despite some power, CD suffers from the lack of a GEM-type interface.

▲ A powerful low-cost package
▲ PostScript supported

▼ Formatting commands entered as code
▼ Terrible manual complements a difficult interface

Value for money ★★★

● SHAKESPEARE

Cloudhall • 0604 231 2111
£99

The only budget DTP package that allows colour on the page to be carried through to hard copy also supports mono PostScript output and is frame-based. However there's no zoom facility and font,style and size attributes are lost when text is reflowed. IFF colour graphics can be imported but not HAM, however 32 colours can be displayed on screen and palettes changed accordingly.

▲ Ideal for colour printer owners
▲ Accurate text positioning

▼ No format data can be imported with text
▼ No drawing tools included

Value for money ★★★

ST DTP

● PUBLISHING PARTNER

Clik ST • 0753 682 988
£159.99

Excellent GEM-based pagemaker system, with multiple-on screen pages, impressive range of fonts and text sizes and facility to import different ST graphics formats. Also includes a range of drawing tools and variable magnification. Fast screen updates and high quality printer output

▲ Comprehensive and fast
▲ Excellent value

Value for money ★★★★★

● SIGNUM 2

Signa • 0252 31600
£184

Billed as a document processor, Signum allows text to be placed and adjusted to accuracies of up to 1/90th of an inch as well as imported graphics and technical fonts and symbols. Dot-matrix and laser printers are supported.

▲ Fast screen updates and response
▲ Compatible with Signa's scanners, digtisers and Mac emulators

▼ Price

Value for money ★★★

Also available:

● FLEET ST

£115

● TIMEWORKS

£99.95
see PC guide above for comments

ARCHIMEDES

● IMPRESSION

Computer Concepts • 0442 63933
£171

Designed specifically for RISCOS, *Impression* multi-tasks with other applications and supports data transfer between them. Capable of handling complex magazine layouts it comes with an outline font manager and typesetting quality printouts.

▲ Ease of import and editing
▲ Super-fast screen handling

Value for money ★★★★

● ACORN DTP

Acorn • 0223 245200
£149

Similar to the original *PageMaker* for the BBC B, Acorn's own package is based around frames into which a wide range of text styles, sizes and fonts can be combined with a range of imported graphics to produce high-quality printed output

▲ Demands a knowledge of DTP
▲ Fast screen handling

Value for money ★★★

● VIDEON
Power Computing
£250

Good quality digitising on a par with *Digiview*. Software allows image enhancement, zooms, pixelisation and ability to transfer images onto surface of objects generated in art packages. Images of up to 4,096 colours can be captured and multiple images shown on screen simultaneously.

▲ Good quality digitisation
▲ Can digitise 4096 colours

▼ Slow scan rate
▼ No frame buffer

Value for money ★★★★

● DIGI-PIC
PRECISION SOFTWARE • 081-330 7166
£299

Up to 16 grey scale levels are supported with this impressive hardware which also includes a colour wheel for RGB scanning. Intuition pull-down menus afford easy operation and access to all functions leaving the main screen uncluttered. Software controls include quantisation,contrast, and edge

▲ Fast operation
▲ Supports up to 32 colours

▼ Low-res only

Value for money ★★★

ST

● TURBO-DIZER
SOFTWARE EXPRESS • 021-328 3585
£149

Camera, video recorder or TV pictures can be digitised via the plug-card as colour or grey scale images which can be treated for brightness and contrast. Images can be saved to disc as *Neochrome, Degas* or *Art Director* format files for subsequent manipulation. Only high- res pictures can be saved for DTP use.

▲ Good range of control for the price
▲ Excellent results in hi-res mode

▼ Slow scan time
▼ Animation only possible in lo-res

Value for money ★★★★

● SAM DIGITISER
START SYSTEMS • 0304 369364
£249.95

An excellent real-time frame grabber for capturing images in 16 colour lo-res format. Entire sequences can be saved – 10 on a 520, 24 on a1040, 52 on a Mega ST2 – and animations run at variable speed in forward or reverse.

▲ Blur-free, sharp frame capture ability
▲ Good animation and control

▼ Only operates in lo-res mode

Value for money ★★★

ARCHIMEDES

● REAL-TIME DIGITISER
WATFORD ELECTRONICS • 0923 37774
£249

Billed as the best digitiser for any micro, it provides a fast and flexible means of digitising. video camera, recorder and off-air pictures can not only be captured but treated and manipulated in real-time to a range of effects.

▲ High-quality image capture
▲ Fast processing and control

Value for money ★★★★★

● I/O PODULE
BRAINSOFT • 071-486 0321
£137

Part of a multiple input/output podule that incorporates a sound sampler, ROM sockets, RS232 and joystick interface, the I/O comes on a half height euro-card and can digitise up to 256 levels of grey. Colour is also provided, but can digitise in any graphic mode in any case. Up to two seconds can be scanned in MODE 12 or MODE 15 thus allowing animated sequences to be played back or incorporated into paint packages.

▲ Good level of sampling
▲ Part of a excellent suite

Value for money ★★★★★

PCW

● VIDEO DIGITISER
ELECTRIC STUDIO • 0462 675666
£99.95

Plugging into the expansion port and accepting either camera or recorder input. The resultant image can be used in any DTP package

▲ Auto contrast control

▼ Quality not as good as scan

Value for money ★★★

BBC

● BEEB VIDEO DIGITISER
WATFORD • 0923 37774
£114

Up to eight grey scales form pictures can be compressed, stored to disk and output to Epson-compatible printers. On-screen images can be treated as a normal graphic.

▲ Unit can be driven from BASIC

Value for money ★★★★

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PCW GRAPHICS

● MASTERPAINT/ MASTERSCAN

Database Software • 051-357 2961
£79.95

PCW and painting programs? Now it is a possibility with *MasterPaint* from Database Software. You can draw circles, ellipses, boxes, use fills cut and paste etc. There's comprehensive text manipulation and a variety of fonts. Only available with the Masterscan scanner

▲ Fully featured
▲ Exploits the power of your PCW

Value for money ★★★★

CPC GRAPHICS

● ADVANCED ART STUDIO

Rainbird • 071-240 8838
£22.95 disk only

Very similar to the Spectrum and Commodore 64 versions this popular painting package produces pixel appointed perfection and performs well!

▲ All the features necessary for pretty pictures
▲ Reasonably priced

Value for money ★★★★

SPECTRUM

● ADVANCED ART STUDIO

Rainbird • 071-240 8838
£22.95

Superior painting program for Spectrums equipped with 128K or above. Plenty of fills, colours and features such as zooming, windows and text handling. Reasonably priced and featured.

▲ Plenty of tools, colours and fills
▲ Easy to use

Value for money ★★★★

COMMODORE 64 GRAPHICS

● ADVANCED ART STUDIO

Rainbird • 071-240 8838
£22.95 disk only

Very similar to the Spectrum version but works with the basic Commodore 64 as well as the larger RAM memory machines. Fine range of features for a reasonable price.

▲ Full featured
▲ Plenty of colours
▲ Works with the 64K machines

Value for money ★★★★

DIGITISERS

● VIDI

ROMBO PRODUCTIONS • 0506 414631
(free demo disc available)
FOR PC £115
FOR AMIGA £99.95, £119.95 (colour version)
FOR ST £99.95
FOR PCW £99.95
FOR CPC £99.95

Grabs 16 shades of grey from videotape recorder or camera with software. the plug in card feature as a phono socket for the video signal input and controls for brightness and contrast. depending on the machine,the software allows real-time capture and display – on the Amiga it's four frames a second. If you have extra memory you can store images in RAM and play back animated sequences.

▲ Good low-cost performance
▲ Can control hardware from your own programs

▼ Performance dependent on host machine

Value for money ★★★★★

● THE DIGITISER

DATEL • 0782 744707
FOR AMIGA £89.99
FOR ST £79.99 (works in mono and colour)
FOR COMMODORE 64 £79.99

Plugging into a parallel port, the hardware frame grabs at 1/50th second and screen updates at one frame per second allowing the software to edit,cut and paste portions of the 16 grey scale picture along with special effects such as reversals and mirroring.

▲ Impressive features at the price
▲ Single, continuous or buffered display

Value for money ★★★★★

AMIGA

● DIGI VIEW GOLD

HB MARKETING • 0895 444433
£130

This minute digitiser plugs into the parallel port and comes with an accompanying colour wheel which attaches to a video camera for colour grabbing individual RGB signals. Grey scale digitising is also supported and both results are extremely impressive. Saturation, brightness and sharpness can all be controlled.

▲ Very impressive in HAM mode
▲ Features overscan, extra half-brite and line art support

▼ Needs 1Mb
▼ Lengthy scan times

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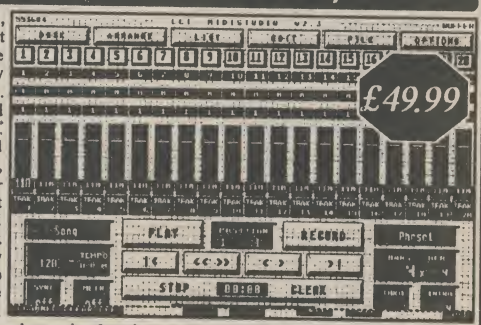

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All our ST prices include: mouse etc. plus 5 disks of software including 'First Word' wordprocessor, utilities, 'Neochrome' graphics utility, game and demos.

NEW - 520 STFM DISCOVERY PACK

Good quality, good value package based around the 520STFM computer including 512K RAM, 1Mb Drive and built-in TV modulator. Also supplied is:

STOS Game Creator
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Amazing value, special ST package from Atari! Includes the very latest 520STE with 1Mb drive, joystick, mouse, user guide, 5 disks of public domain software, plus an incredible selection of chart-topping software with a total RRP of over £500! Software included is:

R-Type, Afterburner, Double Dragon, Super Hangon, Space Harrier, Overlander, Pacmania, Starglider, Super Huey, Eliminator, Predator, Bombjack, Out Run, Bombuzal, Xenon, Gauntlet II, Black Lamp, Starray, Nebulus, Stargoose, First Music, First Basic, Organiser

All for only **£339.00** Inc VAT & delivery

STE Memory Upgrades (SIMMS modules)

Simple plug-in modules with fitting instructions. Please note that you cannot mix RAM module types eg. (0.5Mb with 1Mb). We will fit them for you free of charge when bought with any STE; simply add the cost of the upgrade shown below to the price of the STE.

0.5Mb (2x256K modules, upgrades 520 STE to 1Mb)	£59.00
2Mb (2x1Mb modules, upgrades 520/1040 STE to 2Mb)	£175.00
4Mb (4x1Mb modules, upgrades 520/1040 to 4Mb)	£350.00
1040 STE includes 1Mb drive, 1Mb RAM, with built-in TV modulator	£399.00
520STFM 1Mb Drive Upgrade Kit with full fitting instructions	£74.95
520STFM 1Mb Memory Upgrade Kit, requires soldering	£59.00
Mega ST1 with monochrome monitor	£599.00
Mega ST2 with monochrome monitor	£849.00
Mega ST4 with monochrome monitor	£1099.00
SM124 monochrome monitor ..... £109.00 bought with an ST	£99.00
SC1224 colour monitor	£279.00
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Vidi-ST 16-tone video frame grabber inc.digitising software	£89.00
5.25" External Drive 360/720K 40/80 track switchable	£99.00
Lynx Portable Entertainment System inc.PSU & 'California Games'	£169.00

Amstrad PC1512/1640/2086

Free with 1512 models... Ability and 4 US Gold Games

	SD	SD	AMS H.D.	SD 21MB	DD 21MB	DD 32MB	DD 32MB
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COLOUR 1512	433.91 **499.00**	555.65 **599.00**	N/A N/A	629.57 **724.00**	716.52 **824.00**	641.74 **738.00**	728.70 **838.00**
MONO 1640	477.39 **549.00**	554.35 **649.00**	738.26 **849.00**	673.04 **774.00**	760.00 **874.00**	685.22 **788.00**	772.17 **888.00**
CGA (COLOUR) 1640	564.35 **649.00**	651.30 **749.00**	825.22 **949.00**	760.00 **874.00**	846.96 **974.00**	772.17 **888.00**	859.13 **988.00**
EGA (ECD) 1640	651.30 **749.00**	738.26 **849.00**	912.17 **1049.00**	846.96 **974.00**	933.91 **1074.00**	859.13 **988.00**	946.09 **1088.00**
2086 MONO	520.87 **599.00**	607.83 **699.00**	781.74 **899.00**	716.52 **824.00**	803.48 **924.00**	728.70 **838.00**	815.65 **938.00**
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2086 12" HRCD	694.78 **799.00**	781.74 **899.00**	955.65 **1099.00**	890.43 **1024.00**	977.39 **1124.00**	902.61 **1038.00**	989.56 **1138.00**
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12 MONTHS ON-SITE MAINTENANCE PROVIDED WITH ALL MODELS OF PC1512, 1640 AND 2086 FREE OF CHARGE!

upgrades / accessories

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Maths Co-processor 8087-2 ..... £119.00	3.5" drive (720K) for SD models £79.95
NEC V30 (8086 replacement) £24.95	PC2000 series compatible
Archive XL 40Mb Ext. tape streamer .. £379.00	5.25" (360K) external drive £84.95
Amstrad Modem Card V21/23 ..... £99.00	Genius GM6000 Mouse package £32.95
Communicate Fax Card SR £199.00	Konix Joystick & Controller Card £28.95

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Low prices on all portable PCs - especially twin drive models
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Low price External 3.5" floppy drive (720K), suits any Amstrad PC 1512/1640 inc. DD and HD models, uses no expansion slots £99.95

AMIGA 500 LOW COST RAM UPGRADE

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512K RAM/CLOCK EXPANSION FEATURES :

- ☆ Direct replacement for the A501 expansion
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Amiga & ST 3.5" Drives

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Fully compatible, high quality 3.5" external drives for the ST and Amiga

Amiga version only £64.95
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10...£ 9.95 in plastic case £11.95
25...£22.95 in 40 cap case £29.95
Fully guaranteed double sided media

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All prices include VAT, delivery and cable

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We use and recommend Star printers since they do offer an unbeatable combination of features, print quality, reliability and value. Get it right with a Star at our special, all in, prices. We can provide on-site maintenance contracts for only £5.75 extra.

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ATARI Lynx Portable Games System

- Fantastic hand-held portable 16-bit video games machine
- Excellent built-in high definition, full colour LCD display
- Capable of displaying up to 16 colours out of a possible 4096
- 32-bit audio processor produces superb 4-Channel sound
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- Free California Games (multiplayer) games card supplied!
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Amiga 500 Packages also include the following : Karate Kid II, Leatherneck, Battle Squadron, Jaws, Defcon 5, High Steel, Better Dead than Alien, Nigel Mansell's Grand Prix, Night Walk, Super Huey, Goldrunner

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Omega Projects MIDI Interface	£29.95	Philips CM8833 colour monitor inc.cable	£259.00
Vortex System 2000 40Mb Hard Disk	£499.00	Contriver Hi-Res replacement Mouse pack	£22.95
Vidi-Amiga Inc.Vidi-Chrome	£110.00	Amiga 500 dust cover	£4.95

CBM A590 HARD DRIVE

Good quality 20Mb Hard Disk from Commodore, including its own PSU. Features sockets for up to 2Mb of FAST RAM expansion (see below). 80ms Access time, with up to 2.4Mb/sec transfer rate. Will autoboot when used with Kickstart 1.3. Has built-in cooling fan.

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A590 512K RAM Upgrade kit	£36.00
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PYE 15" FST TV/Monitor (MODEL 2325)

With its dedicated monitor input, this model combines the advantages of a high quality medium resolution monitor with the convenience of remote control Teletext TV - at an excellent low price !

- ✔ Suits ST or Amiga (cable supplied)
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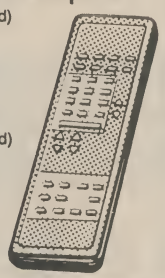
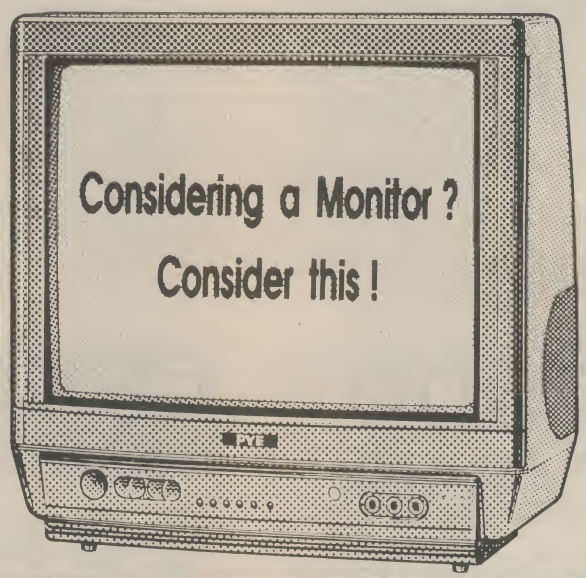


£249.00 includes VAT, delivery and computer connection lead



ATARI ABC-286

Prices include Olivetti DM100S printer and Logotron '8-in-1' integrated software package !

- ☆ 80286 Processor with 8 Mhz clock speed
- ☆ 640K RAM standard, expandable to 1 Mb
- ☆ 3 AT / XT compatible Expansion slots
- ☆ 1 RS232 Serial and 1 Parallel ports
- ☆ Disk controller supports 2 floppy & 2 hard drives
- ☆ One 3.5" (1.44Mb) floppy drive and a 30Mb hard disk drive fitted as standard
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- ☆ 102-key DIN spec. AT-Protocol keyboard
- ☆ Supplied with MS-DOS 3.3 and GW-BASIC

ABC-286 S.D./30Mb with Mono Monitor ..... £ 999.00
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Optional 5.25" 1.2Mb internally fitted floppy drive available £119.00
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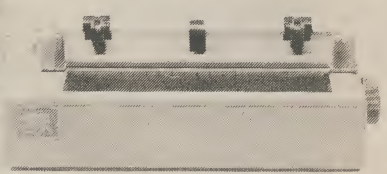

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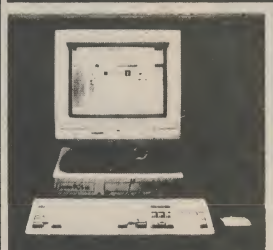

FREE WITH EVERY PCS286 : OLIVETTI DM100S 9-PIN PRINTER ! or if you prefer, £129.95 inc.VAT allowance on another printer of your choice.

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PCS86 MONO	649.00 746.35	749.00 861.35	949.00 1091.35	N/A N/A
PCS86 COLOUR	899.00 1033.85	999.00 1148.85	1199.00 1378.85	N/A N/A
PCS286 MONO	N/A N/A	1049.00 1206.35	1149.00 1321.35	1249.00 1436.35
PCS286 COLOUR	N/A N/A	1299.00 1493.85	1399.00 1608.15	1499.00 1723.85

- ◆ 101/102 key AT-layout PS/2 compatible keyboard (Mini-DIN)
- ◆ 1 x RS232 Serial interface and 1 x Centronics Parallel interface
- ◆ VGA compatible (OVC) display controller fitted standard
- ◆ VGA monitors: 14" Colour / 12" Mono. (dot pitch 0.39mm)
- ◆ Socket for Optional Maths Co-Processor
- ◆ Hard Drive versions: 20Mb (27ms access time) / 40Mb (29ms)

Logotron 'Eight-in-One' package includes Wordprocessor, Database, Spreadsheet, Graphics etc. 'Top 10 Solid Gold' games pack includes Arcade, Adventure, Creativity, Simulation & Strategy titles.

PCS 86
- ◆ NEC-V30 microprocessor 10Mhz clock speed, 0 wait states
- ◆ 640K RAM standard, upgradeable to 2.5Mb on motherboard
- ◆ Single or Twin 3.5" floppy drives with 720K formatted capacity
- ◆ 3 Full size XT-compatible 8-bit expansion slots

PCS 286
- ◆ Intel 80286 microprocessor 12MHz clock speed, 1 wait states
- ◆ 1Mb RAM standard, upgradeable to 4Mb on motherboard
- ◆ Single or Twin 3.5" floppy drives with 1.44Mb formatted capacity
- ◆ 3 Full size expansion slots; 1 x 8bit and 2 x 16bit (XT/AT style)

ACCESSORIES

5.25" 1.2Mb/360K drive with controller	£129.95
PCS 286 2Mb RAM Upgrade Kit	£175.00
PCS 286 4Mb RAM Upgrade Kit	£350.00

ATARI: 2SMB upgrade board, cost £299, never used, only £235. Write: Jerome Pimmel, Springfield Lodge, Kings Road, St. Peter Port, Guernsey. Genuine reason for sale.

AMSTRAD CPC6128 colour £150. (0582) 764051. Also various software, call for details.

CITIZEN Swift 24 printer with colour kit, all manuals and leads, only 3 months old, still under guarantee, £260 o.n.o. Tel: Stu, (0423) 524046.

SEGA for sale. Light Phaser, 2 control sticks and 27 games including Phantasy Star, Wonderboy 2 and California Games. Phone Simon on (0246) 419308. £300 o.n.o.

BBC ROMS:- Mega 3 £65, Interbase £30, Spellmaster £30, Quest/Conquest Mouse £65, Wapping Editor £55, PMS Publisher/Fonts £45, Advanced DFS (ACP/Pres) £15. (0452) 506361.

AT286 2Mb 50 meg hard disk, 3 months old, VGA card, no monitor 1.2 + 1.4 floppies bundled with £3000 software. Phone for details, offers around £200, will deliver. (0639) 849727.

TANDY Pro32 200 channel programmable hand held scanner 88-512Mhz with extra aerial and handbook cost £250, sell £150 or W.H.Y. Re A500. Phone 041-551 0320.

BARGAIN 20 5.25" DS/DD discs inc. labels and 50 capacity lockable storage box. Accept £10 o.n.o. the lot. Enquiries phone (0255) 506754 after 6pm.

ATARI 520STFM, mint condition, boxed, with joystick, disks, £200 worth of games including Operation Wolf, Speedball, Millenium 2.2, £340. Phone (0457) 865406 after 6pm.

TEN Star Pack for Amiga, games inlcude Ikari Warriors, Wizball, Mercenary, Amegas, Barbarian, Thundercats, Terrorpods, Insanity Flight, Buggy Boy, Art of Chess, not used £40. Phone Mark (0395) 515569.

ATARI 520STFM Explorer Pack, 1Mb disk drive, brand new, unopened, full guarantee, £265. Phone Gavin (0202) 874521.

C64 C2N and disk drive with games inc. Stunt Car, Kick Off and Batman plus free Vic20 only £200. Phone Derek (0505) 682989 after 5pm.

AMSTRAD CPC6128 mono, DMP2000 printer, modulator, RS232 interface, RB2 Trackerball, tape recorder, software, games, blank discs, books, magazines, £550 o.n.o. Phone Dave (0932) 232246 after 7pm or at weekends.

SELLING to upgrade huge collection, Speccy, QL, CPC, Ace, ZX81, Mk14, Hardware, software, books etc. S.A.E. to: Jones, 2 Town Mead, Oakford, Nr. Tiverton, Devon, EX16 9EW.

AMSTRAD CPC464 with green monitor, disk drive, loads of software in excellent condition £225 o.n.o. Tel: (0427) 873738.

CBM64, C2N, leads, software, books, etc. good condition, works well, £120 o.n.o. Phone John 081-521 6220 after 4pm.

RENDALE 8802 Genlock brand new, unwanted gift price £175. (0992) 27340.

AMIGA software - Sherlock, Fish!, Zork III, Red October £8 each. Karate Kid, Sidewinder £5 each. Hunter Killer £3. Write: Mike Laskey, 72 Windermere Avenue, Ramsgate, Kent, CT11 0PL.

CPC464, no power supply, no monitor, hence £50. Also CPC software, tape and disc, from £1. Steve, 53 Royle Street, Northwich, Cheshire.

1040STF Thomson colour monitor, several software packages plus some games, all in original boxes, books and magazines £500 o.n.o. Phone Steve (0923) 265539 (Hemel Hempstead).

ARCHIMEDES A310, including colour monitor, prgrammers reference manuals, as new £600 o.n.o. Tel: (0483) 721228.

COMMODORE 64 midi interface £20 Steinberg Pro/6+ £30, DX7 Editor plus voices £30, Share Investor program £30. 061-998 3494.

PRINTER ribbon brand new unopened for Seikosha GP 505 5" printer £4. Spectrum adaptor for expansion slot (plug in two units) £4. Tel: Nottingham 411537.

GOODMANS 5" mono television with AM/FM radio and cassette player still in box, as new £45 o.n.o. Ring Lee (Sansam) (0482) 447640 (Hull) can't deliver.

ATARI Lynx, brand new, unopened, full guarantee, California Games, Power Supply £160. Phone Gavin (0202) 874521.

C64, Datasette, 1541D/D plus £200+ Flight Simulator software inc. Flight Sim. II + extra discs, F14, Gunship, Stealth Fighter etc. All boxed, ex. cond. £175. Tel: (03943) 4037.

AMIGA software, Super Hang-on, Triad, Interceptor, Barbarian II, £8 each. Spitting Image and Insanity Fight £2.50. Las Vegas £2.50 (0703) 766949 after 7pm.

DISK drive CBM 1541 plus box of disks £60. (0703) 766949 after 7pm.

NINTENDO Comes with leads and both joypads, 2 games, Mario and Super Mario Bros. The perfect starter pack. All boxed £65 o.n.o. Phone Robert on (075786) 655.

STB Grande byte 2.5Mb RAM card for AT fully populated start addresses any multiple of 128k. Will backfill. Ideal for 386 using Qemm £210 with manual. Phone Peter (0256) 780325.

SINCLAIR QL+ Serial Printer, Centronics Interface, software, 40+ cartridges, QL world & Quanta magazines. Also books, manuals including Technical and mono monitor £95 + P&P. Nr Bristol (0454) 419082 after 6.30pm.

AMIGA games Garrison, Wanted, Chess, B. Valley, Pool, Thundercats, Mercenary, Terrorpods and Slayer from £4-10 each. Tel: (0480) 433598 after 4.30pm or all for £60.

INTERNAL modem for sale. Akhter MDM2400, 4 speeds, Hayes compatible, new, with manual and s/ware £100 only. Phone 081-8066523 eves or w/ends.

48K Spectrum, dual port, joystick, interface, Quickshot 1 and Protec 5000 joystick, leads, manual, tape recorder, all boxed, £350 worth games like Batman, Starglider. Phone 081-866 7152 only £150.

SINCLAIR Spectrum +3, Multiface 3, Quickshot Turbo, tape recorder, leads, disks, games worth £400 like Operation Thunderbolt, Double Dragon 2, Cybernoid 2, only £250. Phone 081-866 7152.

A500 Amiga 1084 monitor 1 meg upgrade 2nd drive, midi interface, software £600 o.n.o. Ask for Scott after 6pm 081-399 1619.

AMIGA A500 expanded plus external drive, Citizen 120D printr, midi interface, Music-X, Protext, Prodata, joystick, etc. several games (Populous, Starglider II etc) All perfect. Leicester (0533) 824579.

AMIGA B200 revision 6.2, 49 meg autoboot SCSI hard drive, 8833 monitor, all 2 months old. Best offer secures, will split. Phone Kevin on (0453) 766857 after 6pm.

AMIGA A500 1 meg, TV modulator, 2nd disk drive, some software, best offer secures. Phone Kevin on (0453) 766857 after 6pm.

MONITOR Microvitec CUB 1451. £120 printer Shinwa CPA-80. ST cable, book, £60. Ron Lyn, 15 Canterbury House, Royal Street, London, SE1. Will deliver London area.

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COMMODORE Amiga A500 + 1 meg upgrade, Cumana drive, joystick, 300+ blank disks, 1.2 ROM originals, loads of magazines, null modem cable etc. £500. Tel: (0983) 64435.

SEGA megadrive PAL 3 games: Golden Axe, Ghouls and Ghosts, Altered Beast worth £300 will take £200 o.n.o. Phone 081-943 2056 after 1pm.

SPECTRUM 48k, 20-Profile keyboard, Alphacom printer, games, books £50 including postage. Dragon 32 boxed as new £35 including postage. Jupiter Ace 16k £25 inc. P&P (0454) 419082 after 6.30pm.

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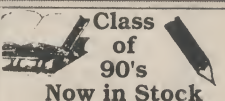

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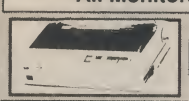

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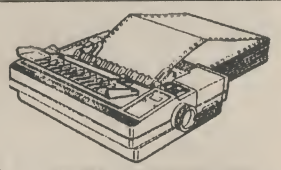

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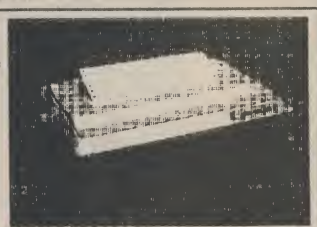

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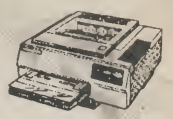

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THE PD COLUMN

There is a lot of software out there available for the price of a disk. Our weekly column by Jerry Glenwright explores the world of the public domain.

One of the most popular Mac games, certainly the one which is played more than any other in the *Express* office, is *Crystal Quest*, a scavenging game involving the player chasing around trying to collect a screenful of crystals while avoiding a variety of horrid creatures attempting to put paid to the gathering.

Crystal Quest is a thrilling and addictive game which has just one drawback – its enormous price! But clever PDers who know where to go can get hold of *Crystal Raider*, the forerunner of *Crystal Quest*, free – well, almost. For *Crystal Raider* is a shareware game costing just £10. That's right! Featuring almost all of the goodies found in the commercial offering, *Crystal Raider* is a must for those who like some fast and furious action between bouts of spreadsheet tinkering.

The game begins relatively easily, with just a few of the precious crystals on screen and if you're fast, it's possible to collect them all before any creatures appear. Soon however, more and more loathsome aliens come tumbling out onto the screen and in the later stages, as well as being chased for your life, there's a variety of almost unavoidable barriers dotted around to make life even harder, spelling instant death for those unwary souls making contact with them.

Your scavenging craft is controlled with the mouse but even that operation isn't as easy as it sounds, for the mouse merely controls velocity rather than direction. What this translates to is a movement which feels as though it were being performed under water – difficult until you become experienced.

Featuring a high score table and lots of spot effects, *Crystal Raider* should top any gamer's list.

• The game begins relatively easily, with just a few crystals to collect...

...soon however, you'll be fighting for your life against horrendous obstacles.

ATARI XL/XE

Almost all of the 8-bit home computers featured operating systems which dumped the user straight into BASIC. Rather than enabling you to run BASIC and other compilers from the command line, the machines simply booted up into the language – if you wanted to perform any kind of system action you had to resort to machine code. OK, it's possible to get used to this. But what really made the situation difficult is that most machines were equipped with the most appalling BASICs imaginable and the Atari 8-bit series was no exception. Several developers released replacement languages but none were adopted completely until the emergence of Turbo BASIC several years ago.

This latter language consisted of a fast compiler and super-extended BASIC of quite unbelievable quality, but what made the language truly remarkable was its lack of price tag. Turbo BASIC is, amazingly, in the public domain.

Turbo BASIC originated in Germany where the machine is taken far more seriously than here in the UK.

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After undergoing translation by the Western New York Atari User Group, the language became widely available and now you can get it for the price of a disk.

Featuring structured programming functions including `REPEAT UNTIL`, `WHILE WEND` and `DO LOOP` mechanisms, procedural labels, and lack of line numbers, Turbo BASIC is perfectly suited to professional application development. There are extended graphics commands such as `CIRCLE`, `FILL TO` and `PAINT`, memory operations, `DPOKE` (a double location poking function), block moves and a `TIME` command.

You have full access to disks from within the Turbo BASIC environment and can rename, load, run and delete files as well as locking and unlocking and requesting directory listings.

But what makes Turbo BASIC stand head and shoulders above commercial replacement BASICs is the truly excellent compiler which accompanies the language. Simple to use, this compiler will transform native Atari or Turbo BASIC into efficient machine code which executes up to 15 times faster than ordinary BASIC.

The compiler can be used with any combination of disk drives and will work quite happily with the 130XE's extra memory RAM drive. Put the compiler and BASIC program into the RAM drive and compilation is performed almost instantly.

Generally regarded to be of a quality and power far in excess of anything mere money can buy, Turbo BASIC is an absolute must for anyone serious about programming their Atari.

COMMODORE AMIGA

It's a fact of Commodore-owning life that there are probably more viruses for the Amiga than for all of the other home computers put together, and more appear all the time. Insidious fragments of code which burrow into your disks and at the appointed hour destroy valuable data and program code.

Fortunately, ridding disks of the dreaded virus is a simple matter of using *Install* or one of the many PD virus killers to clear out the disk's boot block and restore order. Fine. But almost all commercial games use the boot block to store much needed code. Programming houses almost invariably use customised boot blocks in order to protect their games from pirates and unfortunately, these are spotted by virus killers and, because they look very different from ordinary boot blocks, are interpreted as being virus infected disks. The problems occur when you run a virus killer, zap the boot block then try to run the game – it won't work! You've just killed over £20-worth of hot arcade action.

Now however, there's an alternative. *Bootblock Champion* 3 is a little utility which can make perfect 'back-up' copies of boot blocks from commercial games. After firing up the program, you're presented with a series of floppy drive icons. Select the floppy you wish to check out and *Bootblock Champion* will test and report on the bootblock of that disk. If it's clean, you can save an exact copy disk. Now if you suffer a virus attack, or simply corrupt the bootblock of the disk, restoring the game to its working order is a simple matter of writing the saved bootblock back to the original disk. Hey presto! Instant resuscitation. *Bootblock Champion* 3 can be found on Fish disk 298. ■

WHERE TO GO...

Many PD libraries advertise in Shopping Express, but these are also worth a look.

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- **Goodman Enterprises, 16 Conrad Close, Meir Hay Estate, Longton, Stoke-on-Trent ST3 1SW.**
- **Page 6, PO Box 54, Stafford ST16 1DR. The company also stocks a wide range of Atari 8-bit PD.**

CP/M

- **The CP/M User Group, 72 Mill Road, Hawley, Kent DA2 7RZ.**

AMSTRAD CPC

- **Wacci UK, 9 South Close, Twickenham TW2 5JE.**
- **DW Software, 62 Lascelles Avenue, Withernsea, North Humberside.**

COMMODORE AMIGA

- **George Thompson Associates, Dippen, Brodick, Aran,Scotland KA27 8RN.**
- **Softville PD Service, Unit 5, Stratfield Park, Elettra Avenue, Waterlooville, Hampshire PO7 7XN.**

PC AND COMPATIBLES

- **Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL.**
- **Seltec Computer Products LTD, Northumberland House, Staines Business Centre, Gresham Road, Staines, Middlesex TW18 2AP.**

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- **The Macintosh User Group UK, 55 Linkside Avenue, Oxford OX2 8JE.**

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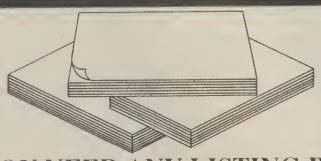

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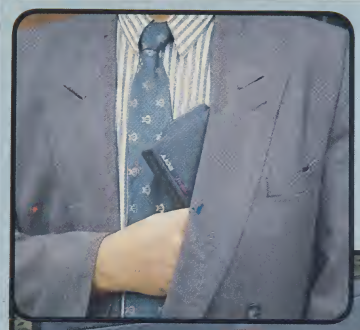

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IN A CLASS OF THEIR OWN

The Learning Curve from Acorn and Commodore's Class of the '90s both contain a computer, some goodies and a heavyweight bundle of software aimed squarely at parents looking for an educational machine. Keith Pomfret asks which is the best buy...

Both Acorn's The Learning Curve and Commodore's Class of the '90s have arrived at a time when parents are wandering the technological wilderness, looking for ways to help their children with the requirements of the new National Curriculum.

Acorn has joined with *The Sunday Times* to commission a guide to the National Curriculum and bundled it in the £799 The Learning Curve. Commodore seems happy to include what it thinks is relevant software in Class of the '90s and assume that learning the relevant computer skills will do the rest.

HARD AND SOFT

In hardware alone the Acorn A3000 wins hands down as the faster more elegant computer – it has more recent technology and twice as much memory. But as past experience has shown, it's not what the machine *is* that matters but what it runs. Since both machines were announced as stand-alone computers, the Amiga has amassed huge quantities of software from simple PD utilities, through games to state-of-the-art applications.

The A3000, and its big brothers the Archimedes A300 and A400 series, have had a slower start and for a time it looked as though no-one would take advantage of the features that ultra-fast processing and RISC technology offered. Now that has changed, and although there isn't yet a waterfall of products, at least the trickle has become a flow.

THE LEARNING CURVE

Open Acorn's box and along with the machine, documentation and software there's the magazine about the National Curriculum, commissioned by Acorn and produced by *The Sunday Times* as a parents' guide. Next is a videotape. Acorn based The Learning Curve on a survey that indicated a large number of people had up to £1,000 available to spend on an educational package. It must also have assumed that anyone with £1,000 to spare must have already bought the essential video recorder.

The happy smiling face of Fred Harris compliments you on your choice and gently talks you through a painless installation. Everything plugged in, Fred tells you a little bit about disks and disk safety and then jumps into the nitty-gritty of what's in the box.

To someone who hasn't owned a computer before it is a pleasant change from a couple of inch-thick books written by a dyslexic dalek. After installation Fred tells you to stop the video to give you time to get to know the machine – and this is followed by a gentle tour of the applications in the package.

ENQUIRE WITHIN

There is a series of utilities and applications which allows you to configure the system, draw, paint and even edit text. Printer drivers, fonts and demos are also accessible.

For the beginner, there is a utility called *Help*. Once this is loaded, pointing at something on the screen with the mouse brings up text describing its function. For the more games-oriented there is a playable demo called *Lander;* a three-dimensional scrolling game that goes some way to show off the processing power of the A3000 as well as improving hand-eye co-ordination and mouse manipulation. There is also a music utility called *Maestro* that makes it easy to create music and play it back from the computer's internal sound chip.

DOING THE BUSINESS

Acorn rather elegantly gets round the lack of software available by including a PC emulator. Once the emulator is installed, the disk operating system becomes the PC-compatible DR-DOS. Most PCs run on MS-DOS, but DR-DOS from Digital Research runs all the same programs and many find it easier and more friendly. The emulator's claim is that it allows you to bring office software home, and it does seem to run well-behaved PC software – as long as the software is on a 3.5-inch disk and will run in a single drive.

However the kind of software that takes short cuts with the operating system – and there's a lot of it about – simply won't run. Three games we tried, including *LHX Attack Chopper*, caused the system to turn up its toes, and a PC comms program loaded and appeared on screen but wasn't much use. This was because the RS232 serial port and networking aren't included and have to be bought as extras.

On the other hand, five other applications including a word processor, spreadsheet, two databases and a stock control program ran perfectly.

A WORD IN YOUR EAR

First Word Plus is a fully-featured word processor with all the utilities necessary to write letters, short stories, novels, and so on. Editing, selection, layout, style, spelling and help are included on the pull-down menus and there's a graphics facility too. Acorn describes it as the ideal tool for projects. To make life easier for the beginner, a cardboard overlay for the function keys shows where the powerful features are to be found.

GENESIS TO GEOGRAPHY

The jewel in The Learning Curve's crown is *Genesis*, a suite of software that puts the emphasis on linking modules together. A demo of a European Geography module begins by showing a map of Europe, then by clicking on France a screen with a map of France is shown.This highlights Paris and emphasises both geographical and population statistics.

An animated picture of the French flag can be clicked on to reveal other flags and a small musical icon produces a rendition of the *Marseillaise* from the internal sound chip. A small database of composers reveals samples of their work as well as personal details.

The thing that makes *Genesis* a delight to use and ideal for education is its ability to combine words, pictures, graphics and sound and chain them together. Modules within *Genesis* offer music, graphics, ➤

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words, maps, and desktop design for any project from letterheads to a full presentation.

Acorn made the Archimedes so that it can access and run BBC B software and ROM software. We were unable to try it, but our resident Archie expert assures us that it can be done.

CLASS OF THE '90s

Commodore has approached information technology from a different direction, choosing to bundle traditional applications, a MIDI interface and software, the educational language Logo and an integrated desktop publishing, word processing and graphics production suite.

The integrated publishing package is based on *PageSetter* 1.2 and *Kind Words*. As well as the program disks there are two disks of fonts, a laser printer driver, and an art pack. The idea is to produce your text using the word processor and plan documents and pages using the DTP program. Text can be imported into DTP documents along with graphics and edited on screen. The finished product depends on the printer being used, a standard dot-matrix will hardly do desktop publishing justice but can be ideal for a draft copy. The program will run a laser printer but it's surely a bit much to expect someone to fork out another £1,000 for the machinery – we suggest you borrow one.

2, 4, 6, 8, EMULATE

It has become fashionable for those computers with sufficient processor speed to run emulations of other computers in software. While Commodore has the Bridgeboard to emulate a PC on the Commodore B2000, the standard A500 won't accept this and the software emulator was a little too slow for comfort.

This left Commodore without an acceptable PC emulator for the Class of the '90s but it made up for this with a firm thrust into Acorn's camp

BEEBULATOR

Commodore's answer to Acorn's firm hold on the educational market is to provide an emulator to run software for the BBC B. It will run BBC BASIC programs and some machine code routines, but turns its nose up at commercial games software. This should hearten parents and teachers who have access to the wealth of BBC educational software available.

Staying firmly in the educational arena, Commodore has included the graphics and list-processing language, Logo. When Logo was written it was a simply structured language that kids could understand and which taught them about lines, angles and lists by moving a 'turtle' around the floor. A turtle is a wheeled, dome-shaped motorised buggy with a pen pointing at the floor. By issuing commands the turtle could be made to draw on the floor.

The Amiga version is of course generations on from that, and all the movement is done on a multi-coloured screen with the lines drawn by an on-screen turtle at high speed.

IS IT LIVE, OR IS IT...

Dr T's *MRS* is an eight track music sequencer. It can do most of the things that an eight track recording studio can do except it uses electronic data instead of analogue tape. It can be a little awkward to use at first but is a reasonable introduction into computer music and if you've got a MIDI instrument you can control it from the keyboard. There are a couple of demonstrations of the music software on the disk.

The first is the standard (yawn) Bach-clone, synthesised fugue thing and is predictable. The other one shows off the sequencer better in that it is a rendition of *Hoedown* (from Rodeo) by Aaron Copeland. That in itself wouldn't be too exciting – only this is the Emerson Lake and Palmer rock version. An Amiga doing what four synths and a Hammond organ did? Not quite, but a good try. A Datel MIDI interface is included to get you talking to the outside world.

PAINT THE TOWN

As well as the graphics capabilities of the publishing package, *Deluxe Paint 2* is included – a good, well featured graphics program that has become the standard Amiga drawing tool.

Finally, there's *Superbase Personal*, an easy-to-use database that can put order into any list, be it an album collection, club membership or inventory. Once loaded, a bar of icons across the bottom of the screen allows you to go through the records as if you had them on a tape, with 'fast forward', 'rewind' and 'advance' frame icons looking as if they have been borrowed from a video recorder.

Commodore includes a TV modulator in the Class of the '90s so you can use an ordinary domestic television. While this may save the £200 or more for a monitor, it isn't a realistic economy. Too much desktop publishing on a TV screen and you will soon have your optician in profit.

CONCLUSIONS

Both are heavyweight in the price arena, Acorn coming out heavier at £799 to Commodore's £599 – but both bundles have the same two serious omissions.

Neither The Learning Curve nor Class of the '90s has a monitor or printer, although both put a strong emphasis on colour, graphics, and printed output. A reasonable colour monitor will cost about £240 and a printer will tip the scales by at least another £200 if it is to produce an output that does the programs justice – although a model for just word processing can be had for under £150.

Acorn is aiming at the interactive education target. The software is a fully-integrated, National Curriculum based learning centre. The PC emulator is tacked on to tempt parents to 'bring work home.' A five-year-old will be as at home with The Learning Curve as a 15-year-old will be.

Commodore has put together a series of applications where the emphasis seems to be on learning useful computer skills and applying them in an educational environment. The Class of the '90s can be looked on as a computer literacy tutor as well as an educational package but isn't suitable for the very young – although Commodore is planning another version for parents of younger children. ■

IN THE BLUE CORNER...

Acorn courts a traditional and somewhat staid appearance, which is enhanced by its 'lion's share' of the educational market and the market to which its 'serious computers' have previously gone. The Acorn BBC B has been seen in schools, industry and scientific institutions and more recently the Archimedes and A3000 have won aclaim for their sheer speed and Reduced Instruction Set Computer (RISC) technology. The A3000 is the computer included in The Learning Curve and this shares its architecture with the other Archimedes. It is a 32-bit multi-tasking desktop micro with a single 3.5-inch floppy and 1Mb of memory.

• Acorn's A3000: the most powerful home computer available.

AND IN THE RED...

• Commodore's Amiga: plenty of software.

Commodore is currently cutting a dapper figure in the computer world with its recent launch of the multimedia graphics workstation Amiga, and the serious side of Commodore got plenty of TV exposure in the PC campaign. It is the entry-level Amiga A500 that is included in Class of the '90s.

The A500 is a 512K micro with a single 3.5-inch floppy, the Motorola 68000 processor, dedicated graphics and sound processors and multi-tasking abilities.

DECISION TIME

If a youngster was asked which machine was best the answer might be Class of the '90s – with an eye cocked at the games software available for it. A discerning parent might choose the Acorn A3000 for the same reason – hoping that the investment would reap true education rather than alien bashing.

The answer is to consider what it is these packages actually offer and compare it with what you want. Commodore's is cheaper but Acorn's is more serious. Commodore's has more software but Acorn's is better integrated. It's a lot of money whichever you pick, but for both offer a genuinely useful educational bundle.

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MUSIC: THE MORE UNUSUAL CHOICES

In the last few weeks we have looked at music software for the common MIDI machines, now Jon Bates turns his attention to some less obvious musical choices

Continuing in our series on music and computers, this week we will look at several computers which are less commonly used for music; the BBC, Archimedes, MSX, CPC and Mac.

BBC

Internally the BBC is as well equipped to generate sound as any other computer of its generation, which is in fact not very well. It has the standard three-channel sound chip with optional noises, the same chip that is found on the ST, Spectrum 128, MSX and the rest. It is not terribly versatile and has the overall sound quality that you associate with elderly arcade games. Fun but not terribly serious.

The BBC had a not inconsiderable number of MIDI programs designed for it, the chief architect of these being EMR Software. It produces quite a range of products including eight-track sequencers and voice programmers for most popular synths including the Yamaha DX7, FB01, and Casio CZ series.

As you will recall, the MIDI language can not only control a whole set of instruments, record what is played on them and play it back like a multi-track recorder, but it also enables you to talk directly to the sound chip of the synth and create you own sounds and store them either on disk or cassette, depending on what you have. The advantages of having visual and software help in creating sounds on synthesisers is immeasurable.

You will need a MIDI interface as there is not one on-board; the only one currently available is from EMR and will cost you £79.90.

Of course the main disadvantage of the BBC is its lack of memory. Even the souped-up versions leave precious little memory for large pieces. Despite this there was a very advanced (for its time – 1985) program called the *UMI 2B* which was actually resident inside the BBC on a ROM chip. This was an 16-track MIDI sequencer with the ability to link sections of tracks together to form whole songs.

Since it was inside the machine it left the full memory free for storing the song data, and later versions came with memory expansion boards. As far as I can ascertain it is no longer available new but it does crop up from time to time in the second-hand columns. EMR produces a 16-track sequencer that is also resident on a ROM chip.

There is another solution for the BBC – turn the whole computer into a synthesiser. Hybrid Technology (not to be confused with Hybrid Arts) did just that with its bolt-on systems, the Acorn 200 and 2000. The hardware box and keyboard turn the BBC into an eight-voice synthesiser in stereo.

The Hybrid Technology systems have had many devotees, although I wouldn't count myself among them as they lean too much towards the programming side rather than music writing.

Since so many of UK educational establishments have BBCs there will be a demand for music software for some time.

ARCHIMEDES

Acorn's successor to the BBC is certainly a very fast machine, and you wou'd be right if you guessed that it can cope with quite staggering musical feats. Although MIDI is still not fitted as standard, there is quite a range of programs available for it. The first change is that the internal chip is a rather superior being.

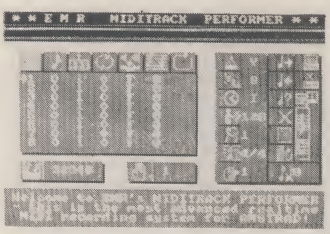
It can cope with eight channels of sound, and outputs in stereo. Any of the eight channels can be placed in the stereo picture, that is to say you can pan them from left to right. Thus it creates a true stereo result, as opposed to some computers which have a 'stereo' output but only simulate stereo.

The chip is ideally suited to processing sampled sound – sound that has been digitally recorded – and most software takes advantage of this. The speed of the computer makes it very good at handling large amounts of information and it can cope with large musical applications with ease.

Again EMR leads the field with a wide range of software which includes waveform sample editing, the *Studio 24* multiple-track sequencer which works with both internal sound and MIDI, score printing software, a keyboard teaching program and software for special needs education.

There are several other companies which specialise in software and hardware for the Archimedes. Clares has developed a sampling system, *Amadeus,* which has a clean eight-bit sound resolution and advanced editing facilities. Armadillo has gone one further and as well as a range of eight-bit samplers also has a 16-bit sampler which will enable direct to hard disk recording; the system is called Highnote.

CPC CORNER



• There is plenty of MIDI software for the CPC – this one is from EMR.

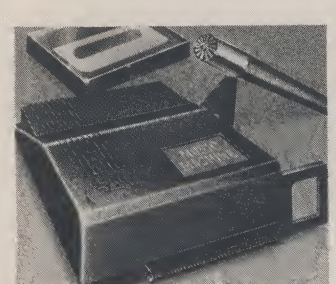
On first sight the 'three square-waves and a bit of white noise' sound chip in a CPC doesn't conjour up the picture of melody and symphonia.

Surprisingly, there are several programs and interfaces to allow you to use the internal sounds – or add a plethora of MIDI modules and instruments.

The best of the internal sound drivers is the *Advanced Music System* from Rainbird. This allows music to be entered via a stave or on-screen keyboard and contains an editor, multi-track function, sound modification, linker and direct output to a printer.

The results from the not-so-inspiring CPC internals have to be heard to be believed and at least one chap has made it his life's work to transcribe the classics on to the CPC

On the MIDI side, things get more exciting with three interfaces and a kit available on the hardware side and professional sequencing and patch editing at the software end of things.



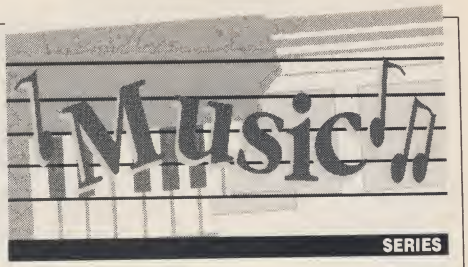
• The Music Machine from Datel.

Datel electronics supplies the Music Machine which is a sequencer, sampler, MIDI interface, drum machine and delay line in one.

The CPC would be hard put to compete with some of the 16- bit professional packages available on Amiga ST and Mac, but as an entry into music that won't break the bank, it is a good start.

A band with more raw enthusiasm than cash managed to go MIDI with a CPC for less than £400, and that included the computer.

MIDI interfaces and software are available from Datel, EMR, and DHCP and the *Advanced Music System* can be obtained from CPC specialist WACCI.



Recording a piece of music direct to disk is a process that many TV and video studios are using. The source music or sound is sampled at a rate higher than CD and recorded directly onto a hard disk. The advantage is that you have complete control over the sound in that you can splice it with another sound, cross-fade, add sections, take sections away, and generally do what you like with it. All this is easily done since you can see the sound represented on screen by a graph-style display. The only way to achieve this previously was to get busy with the scalpel and tape, but now you can have as many goes as you like until the desired effect is achieved.

Pandora Technology has an advanced sequencer called *Imagine!*. It is aimed at the higher end of the market – with a price tag to match – but is capable of running numerous MIDI instruments simultaneously and mixing them all down to produce the finished song.

For all the MIDI applications you will have to buy what is termed as a podule – an interface that fits on to the rear of the computer. This will set you back £79.90 for a basic version from EMR.

MSX

In musical terms you really have to link MSX with Yamaha. Yamaha stepped out boldly with the CX5 series of computers which had a built-in sound module based on its world-beating FM synthesis chips. It had MIDI fitted as standard, as well as true stereo output, and the package came with a plug-in keyboard with either miniature or full-size keys.

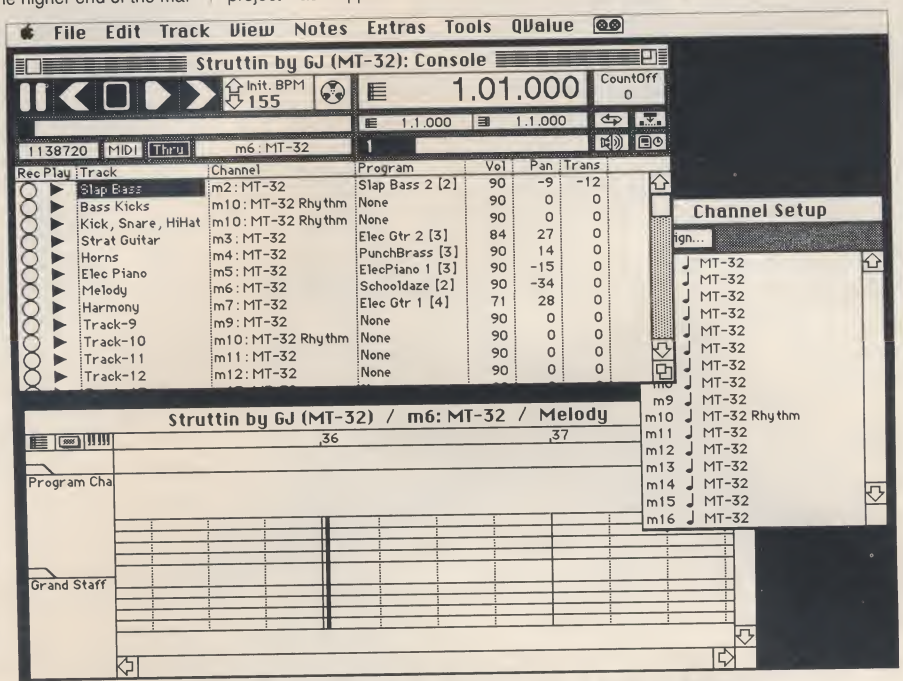
Without any additional software the CX5 had a friendly music program resident that you could call up an any time. It turned the 32K computer into a self-accompanying instrument with rhythms, auto-bass and chord patterns, and you played tunes along with it. The sounds were very good, except for the drums which Yamaha had left to the standard MSX sound chip and sounded pretty awful. You could store tunes in the memory and play them back at any speed.

Yamaha's software was very ambitious. It pioneered the first synthesiser voice programmers, not surprisingly, for its own synths and also came out with a real-time MIDI sequencer that was reasonable if somewhat sticky on editing and quantisation.

It also produced the best step-time sequencer I have yet used. The difference between real- and step-time sequencing is that in real time you play away and use the software like a tape recorder, in step time you put the piece in note for note rather like a typewriter. Yamaha's step-time sequencer allowed for up to eight different parts to run simultaneously – which meant that you didn't need any extra hardware as this corresponds to the number of voices on the sound module.

For a musician it was very instinctive to use; all commands for volume, speeding and slowing down and expression, were abbreviations of the italian music terms, and with only a little bit of practice you could enter notes on the staves nearly as fast as typing. You could print out the results too. A whole suite of educational software followed – chord finders for guitars and keyboards, advanced single keyboard simulators, voicing software for the internal chip and even more for the mark II version, the CX5 with 128K memory.

However, although there was a CX7 which ran on an MSX version 2 (not available in the UK) the whole project was stopped.


File Edit Track View Notes Extras Tools QValue
Struttin by GJ (MT-32): Console
Init. BPM 155
1.01.000
CountOff 0
1.1.000
1.1.000
1138720
MIDI
Thru
m6 : MT-32
Rec Play Track Channel Program Vol Pan Trans
Slap Bass m2 : MT-32 Slap Bass 2 [2] 90 -9 -12
Bass Kicks m10 : MT-32 Rhythm None 90 0 0
Kick, Snare, HiHat m10 : MT-32 Rhythm None 90 0 0
Strat Guitar m3 : MT-32 Elec Gtr 2 [3] 84 27 0
Horns m4 : MT-32 PunchBrass [3] 90 14 0
Elec Piano m5 : MT-32 ElecPiano 1 [3] 90 -15 0
Melody m6 : MT-32 Schooldaze [2] 90 -34 0
Harmony m7 : MT-32 Elec Gtr 1 [4] 71 28 0
Track-9 m9 : MT-32 None 90 0 0
Track-10 m10 : MT-32 Rhythm None 90 0 0
Track-11 m11 : MT-32 None 90 0 0
Track-12 m12 : MT-32 None 90 0 0
Channel Setup
MT-32
m9 MT-32
m10 MT-32 Rhythm
m11 MT-32
m12 MT-32
m13 MT-32
m14 MT-32
m15 MT-32
m16 MT-32
Struttin by GJ (MT-32) / m6: MT-32 / Melody
36
37
Program Cha
Grand Staff

• *Electronic Arts' Deluxe Recorder is typical of the powerful software you can get for the Macintosh.*

As an start to a music system MSX represents a good bargain at present as second-hand prices are between £100 to £200 for a CX5 with software. It is also a rather cheap way to add to a system, and since it is MIDI compatible you can swap information back and forth between machines.

MACINTOSH

It would be fair to say that the majority of professional studios and composers who use MIDI and the like will be running an Apple Macintosh.

Its speed and size make it the ideal tool to work with and, since it is still an up-market machine, the software is trimmed for that market – expensive but very comprehensive. One indication that the Mac may well be moving into larger markets is that the German software house Steinberg has just converted its main program *Cubase* from the ST to the Mac. Steinberg is one of the leaders in music software but has previously written exclusively for the ST.

You would be correct to assume that there is little low-budget software for the Mac. It tends to be very slick stuff and deals with all the facilities that a musician needs. Sequencers are plentiful and many of them have software modules that convert the data into high-quality music notation as used by music typesetters; laser printers are *de rigeur*, you understand. If you were going to set up on a serious footing in the music business, the Mac is really the machine to have.

The programs range from just plain MIDI sequencing and voice programming to direct to hard disk recording and film scoring programs, with tools that will not only synchronise the cues with the video timecode but will squeeze music cues to make them fit into the time available.

As you might expect, the Mac is in the forefront of technological advances and one indication of the way things are going is a program called *D.A.V.E.* from the US company Opcode. It is an extension of its *Vision* MIDI sequencer but as well as recording and sequencing MIDI data it can, with additional proprietary hardware, record audio data as well. In other words you can use it to record MIDI instruments and ordinary acoustic instruments, vocals, or electric guitar at the same time. The program will manipulate both sorts of data simultaneously and is very nearly a complete recording studio on screen.

A list of music software for the Mac would be a long one. Suffice to say that the names look out for are *MasterTracks, Finale, Deluxe Recorder, Beyond, Performer* and any of the programs from Opcode. The main importer for Mac software is MCM. ■

CONTACTS

MCM: 071-724 4104
EMR: 0702 335747
CLARES: 0606 48511
PANDORA: 071-221 9653
ARMADILLO: 0572 822499
ELECTRONIC ARTS: 0753 49442
WACCI: 081-898 1090
DHCP: 0440 61207
DATEL: 0782 744707

NOT A LOT OF PEOPLE KNOW THAT...

...for years electronic composer Vince Clark of Erasure used a BBC running the *UMI 2B* software for song writing.

...if you get hold of the Yamaha MSX tone module you can make it work with any MSX machine by simply using a 'gender bender' edge connector

...the author Douglas Adams uses his Mac for writing music as well as typesetting his books.

...the first Yamaha MSX machines would only store to cassettes and not disks

...the BBC B still accounts for 50 per cent of computers in secondary schools.

NEXT WEEK

We look at the nuts and bolts of music and MIDI in general. What better way to do this than to show you how to build up a piece of music from scratch? All the advice, hints and tips that we can muster will be included. Be there or be square!

CRIMINAL TENDENCIES

Computerised crime can net you millions of pounds – or hefty jail sentence. Andrew Baron took a look through the records to discover how some famous crimes were perpetrated...

For 20 years and more the spectre of computer fraud has been raised time and time again by the media. A widely-held belief is that reported computer crime is only the tip of a very large iceberg, with most cases going unreported.

Express often receives phone calls from bank employees claiming that one of the Big Five has been stripped of millions but it won't publicise the fact for fear of panicking customers.

There is also a belief that much computer fraud is a victimless crime; it goes unreported because no one notices it, a bit like the drunk driver who gets home safely despite being three times over the legal limit.

Defining computer crime as 'the manipulation or corruption of a computer', the overwhelming majority of crimes involved are input or output frauds. The machines are incidental, the frauds would happen anyway. We visited the City of London Police who told us the problem of hackers invading mainframes and stealing vast sums of money or data is largely a myth. In this field, crime where it occurs does so usually as the result of either an in-house thief or someone on the inside collaborating with an external buyer or supplier.

Of the computer-related crimes that do happen in Britain most – when detected – are pretty mundane. In the States however there have been some quite spectacular frauds. So we decided to undertake a little investigation of our own – here are some of the more colourful cases we've encountered.

SALAMI ZAPPING

In 1985, a programmer in an American mail-order company created a salesman and gave him the name Zwana. Zwana earned his commission by rounding down entries from other salesmen and transferring the odd cents to his fictitious account.

The fraud was only discovered after two years when, as a PR exercise, the company's marketing department took the first and last salesmen on the payroll and audited them. Zwana was clearly the last in the alphabet. This kind of scam, the 'salami technique', gets its name because the fraudster takes a very thin slice off everybody else's account. It is also known as application zapping and is very rare, and for a good reason. To set up an application zap – rounding down the genuine accounts and setting up false ones – requires a great deal of technical expertise. Anyone with the ability to do it can almost certainly find easier and safer ways to rip off the company. In fact, the Zwana story is almost certainly apocryphal; in another commonly-told variation of the same scam, the name Zzwicke is used.

Another old chestnut is that of the fraudster who tells the company: "Pay me half of what I stole and I'll show you how I did it". This and 'Zwana' are urban legends in the making.

Another variation on the salami technique is the story of a computer crook working for a US oil company. He was responsible for dealing with garages in a certain area, and set up a fraud specifically to help garage owners. Co-ordinating all the relevant invoices, he gave the garages a discount and arranged for himself to be paid a commission. The sum involved was miniscule, 2.5 pence per gallon, but it soon mounted up to £26,000. The company only caught on when he went on holiday and the price scales reverted to normal. He was sacked, prosecuted and given a four-month prison sentence.

One fraudster included a two per cent discount for prompt payment. It is not known if the judge gave him a discount on his sentence, but he was well and truly nicked.

Even more enterprising was the clerk with five years' service who, over a period of six months, made off with £47,000. He used the system to set up fictitious companies complete with letter headings. Invoices authorised by him went to special holding accounts.

To cap it he included a two per cent discount for prompt payment. It is not known if the judge gave him a discount on his sentence, but he was well and truly nicked.

MEGAFRAUD

A Third World country was negotiating a loan of some £2.5 billion for a number of development projects. For reasons which are not made clear, the president and vice-president decided to keep the deal secret, not just from the public but from the rest of the government as well, so it was arranged through a financier with connections in the Middle East whose contacts demanded anonymity.

Arrangements were made through four institutions, two of them companies in Hong Kong, one a long-established Swiss bank and the fourth a Norwegian bank. The Swiss bank was to provide the deposit and drawing facilities, and the lender's representative was paid a non-returnable one per cent fee and security in the form of a large amount of negotiable securities.

The shroud of secrecy surrounding the deal suited everyone, ostensibly for political reasons. But at the eleventh hour one of the borrowers smelt a rat and arranged for some discreet enquiries to be made. Within 24 hours it became known that the Norwegian bank was a front and the man who had set it up was wanted by the police in Hong Kong. The Swiss bank was genuine, but the two Hong Kong companies were also fronts.

The man behind them had already been involved in a scam which had led to the collapse of a Malaysian institution and was known to have links with organised crime in North America and in the Far East.

Fortunately, once the authorities had been alerted they moved quickly: the con men were arrested, the advance fee was recovered and further criminal connections were uncovered. Just as importantly, no one lost face, but this could easily have become one of the biggest successful bank computer frauds in history.

LARGEST CORPORATE FRAUD

It's one thing to know your customers, but when everyone, including the Chairman of the Board is on the take, checks and balances don't count for much. The biggest computer fraud in history started in the mid-60s without the aid of a computer, but by the time the scandal broke in 1973, the web of deceit had been cast so wide that it required a mainframe to keep track of all the dodgy dealings incorporated into it, which included over 60,000 fake insurance policies.

This became known as the great Equity Funding fraud. The Equity Corporation of America was one of the hottest stocks on Wall Street; its success was based on the theory that by dealing in both mutual funds and insurance policies it could make both forms of investment highly attractive.

The idea was that customers would invest in the mutual fund and the company would pay the customer's life insurance out of this, recording the payment as a loan, thus freeing capital which could be used elsewhere. In 1969, Chairman of the Board Stanley Goldblum began an aggressive programme of corporate expansion and acquisition. This inflated the share price and Goldblum and friends were able to unload company stock at a tidy profit.

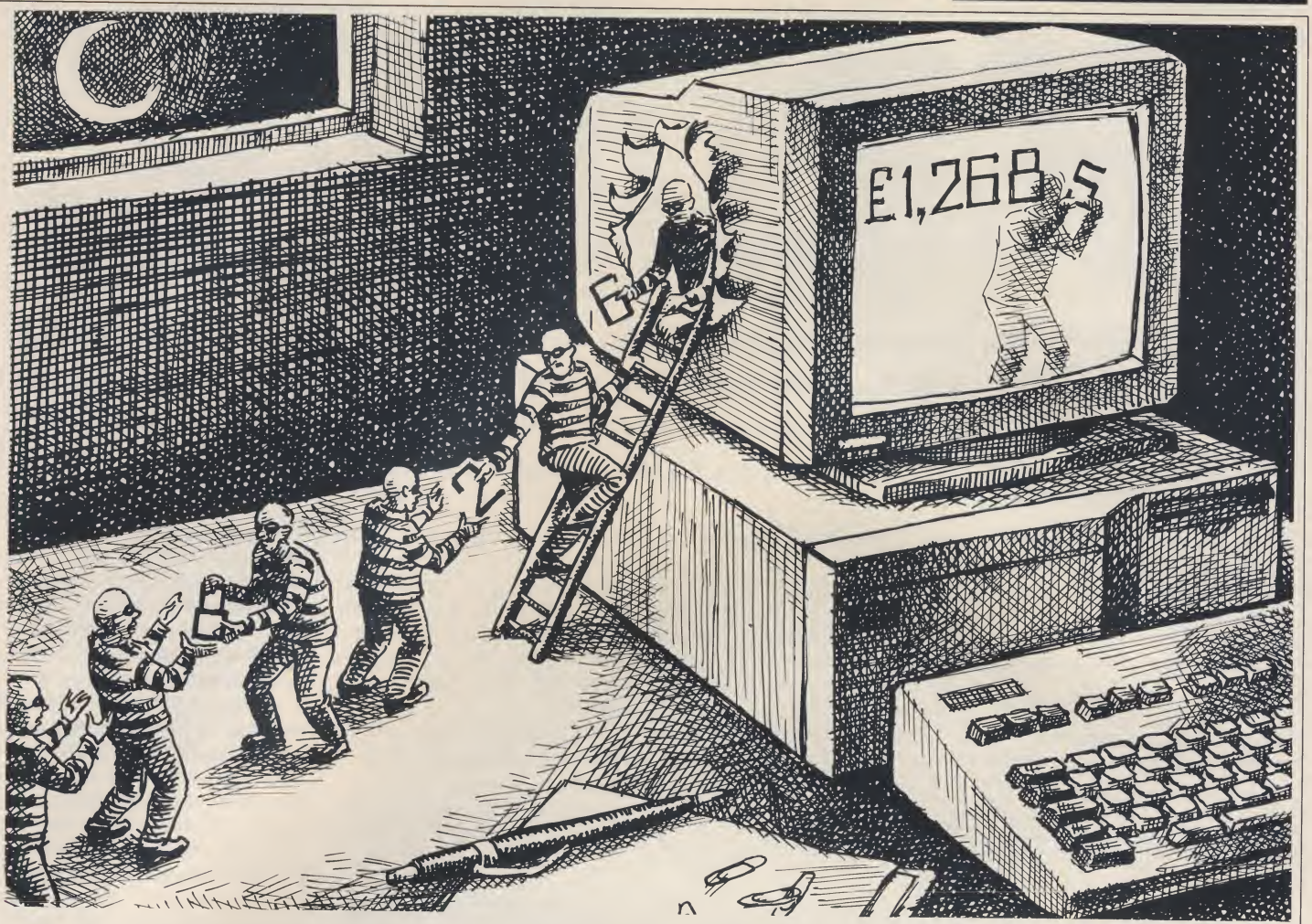
Of course, nobody gets something for nothing, and the expansion was increasingly funded by using the computer to generate 'dead souls', bogus records which were sold to re-insurers. A whole department was specially assigned to this task, and the company even began to run 'fraud parties' at company headquarters which lasted well into the night.

A mere $144,000 was siphoned off into the accounts of particular conspirators, presumably as hush money; the rest stayed in the company until by the spring of 1971 the fraud had grown to such proportions that Goldblum and company needed to generate up to 50,000 new bogus files just to keep it running.

As the scale of the fraud grew, so did the fraud parties, and the company got in deeper and deeper. All fake policies were assigned a special code and the computer was instructed to exclude them.

The bubble was finally burst in March 1973 when a former employee reported the dead souls racket to the police and to a Wall Street analyst. By this time the company had 97,000 policies on file, 64,000 of them fake, and was valued at $737 million of which $185 million was non-existent.

Goldblum and several other conspirators received jail sentences.



$2,000,000 IN ONE TRANSACTION

As well as the biggest, the Equity Funding fraud is possibly the most complex computer fraud on file, but one fraudster netted a cool $2,000,000 in one transaction, and he didn't even have to touch a keyboard.

Opening an account with a New York bank with a substantial sum, he claimed to be a manufacturer of metal furniture on the West Coast and said further that he would soon be opening a plant in the New York area so his account would be receiving a large fund transfer. Which it did, $2,000,000. It was only after he had withdrawn the money and disappeared that it was discovered that both the transfer and his West Coast account were bogus. Further enquiries led to the person who had wired the transfer, his former girlfriend.

She had resigned from her bank job shortly after he had ditched her. Before he disappeared, her boyfriend had asked her to play a joke on a friend of his who, he said, worked as a computer operator in New York. The joke was, of course, to wire $2,000,000 to his account at the New York bank where his imaginary friend worked, which she did. Both the money and the boyfriend had promptly vanished, leaving the bank $2,000,000 out of pocket and the former girlfriend with a lot more than a broken heart.

MAGNETIC INK

A somewhat more complex fraud involved the doctoring of cheques and paying-in slips. One enterprising gent who opened a bank account in Washington procured a special typewriter, one which was equipped to type in magnetic ink, and added the code from his paying-in slips to some blank paying-in slips. Then he left these in the tray at the bank and every time someone paid in with one, the computer would credit the payment to his account.

Altogether a quarter of a million dollars was redirected in this way; he cleared out $100,000 and cleared off with it before the bank got wise. The same scam was perpetrated independently in both New York and Boston.

A variation on this scam involved not paying-in slips but cheques. This time the enterprising individual found a printer to print his own cheques, but with a minor alteration. The three-digit branch code was altered to that of another bank, and several large cheques were fed into the system. The Federal Reserve computer accepted them subject to clearance, but because they were returned to the wrong banks the people processing the cheques assumed there had been a routine error and redirected them.

At one point he had a $25,000 switchboard delivered to a manhole in the road at 2am. He picked it up in a second-hand van and nobody questioned him.

Once a cheque had been presented it continued to be passed back and forth, and the fraud only came to light when they became too frayed to be handled automatically. By that time the perpetrator had withdrawn $1 million in cash and disappeared.

TURN AROUND

Finally, we should mention the case of 21-year-old Jerry Neal Schneider. He seems to have had a fascination with telephone and electronic communication equipment, so much so that he began rummaging through the trash cans outside the Pacific Telephone and Telegraph Company and salvaged a number of operating and management guides.

Later, when he became an engineering student he decided to put these publications to good use. Unfortunately he gave different accounts to different people, so we'll never know exactly how he did it, but by various ruses, including posing as a company employee, he discovered the code numbers, account numbers and the fundamentals of PTT's ordering system. In June 1971 he ordered $30,000 worth of equipment and picked it up the following night. Then he set up his own company: Los Angeles Telephone and Telegraph Company to buy equipment which was charged to PTT's account, and sold on his own to private suppliers. At one point he had a $25,000 switchboard delivered to a manhole in the road at 2am. He picked it up in a second-hand PTT van and nobody questioned him.

Before long he had set up a 6,000 square foot warehouse and employed 10 people! In January 1972, he refused an employee a raise; the disgruntled worker reported him to the police, whereupon Schneider was arrested and charged with a million-dollar fraud. However, at his trial the prosecution was able to prove a mere $5,000 worth of fraud, and after plea bargaining Schneider served 40 days of a 60 day sentence on a prison farm. PTT filed a six-figure civil suit against him which he settled for a princely $8,500 then, after selling his story to a film company, he set up in business as a computer security consultant. Which goes to show: if you can't beat 'em, join 'em! ▩

TECH TIPS

HELP! Which computer?

Does your PC keep packing up? Is your Amiga less than friendly? Would your ST try the patience of a saint? Write to Uncle Tech Tip, he'll see you right. Send your sorry stories to Uncle TT, 30 Monmouth Street, Bath BA1 2AP. There's a prize for the most pitiful tale.

At present I use a 48K Spectrum (*and naturally enough you want to bin it, am I right? – Unc*) with a cassette recorder, a Microdrive, a Seikosha GP100A MkII printer (via an Interface 1), a Datel Electronics printer interface and cassette-based driver software.

My experience is that dealing with cassette-based software is very unreliable and the Microdrive is only a little better. Further, the relatively small amount of memory the Spectrum has is a major limiting factor. Therefore, I am considering a new system.

The initial hurdle seems to be that the computer market is a jungle. I have thus far failed to make any headway in deciding which to choose for the best value as regards my needs.

I think it best to state what I require from a computer and then perhaps with your superior knowledge of the subject, you could point me in the right direction with a few examples. The first and most important factor is cost.

I must limit myself to around £400, or just slightly more if a particular system is thought to represent good value. The second point concerns my needs. I want to do a fair amount of word processing and also use a fairly simple spreadsheet and database. Game playing forms the lowest priority, but the ability to run simulations and gold programs for example would be an advantage.

Specifications are where I get completely lost. I'm thinking of at least 500K of RAM expandable to 1Mb, one or two 3.5-inch floppy drives and the facility to add a hard disk eventually. I need a Centronics port for my printer with additional ports for a mouse and tracker ball. A mono monitor would be an advantage, but I doubt if £400 will stretch that far.

Correct me if I'm wrong, but I have the feeling that IBM PC technology is the best to look for because of the amount and quality of software available – but is there a down-side to this? I read *Express* regularly, and it would appear that the Commodore Amiga and Atari ST dominate the £300-£500 market. Having been loaned an Amiga (albeit briefly), however, I found it rather unfriendly. The syntax and the user manual were, to me at least, very hard to understand, but then I have used Sinclair BASIC for some years now.

Gerald A Carter, Blackpool, Lancs.

It's always a difficult process upgrading, especially if you are coming up from a relatively basic machine such as the original Sinclair Spectrum. I sympathise with your confusion as to what to buy.

Fortunately, there are three choices at the moment – an IBM PC clone, Commodore's Amiga and the Atari ST. It should be easy to choose a system.

You've borrowed – and consequently found that you dislike – the Amiga so let's rule out that machine right away. That default narrows the choices to an ST or PC clone.

You would like to use simple spreadsheet and database programs and carry out some word processing; right. There's plenty of choice as far as programs for both machines, priced roughly at the same level. If, as you state, the main use is for word processing, then forget the ST (at least, the 520 and 1040 STs).

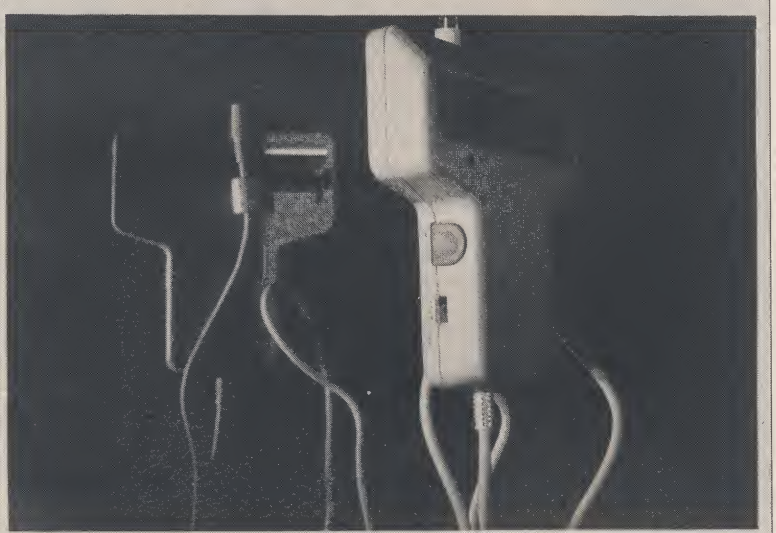
The ST range of machine has an absolutely dreadful keyboard which is hell to type on for any length of time. Strange, because the original Atari 8-bit machines had perfectly usable keyboards – indeed the Atari 800 was equipped with a set of keys that could only be described as excellent! The Mega ST range has a detached, superior

HELP! One in the eye

I am an optometrist (*brave of you to admit it – Unc*) and have been asked to find out if it is possible to link up an Atari ST to a camera or hand scanner, to give magnified images of printed matter on the screen for use by the visually disabled.

I know of the existence of a TV camera that does this but the price is prohibitive, as it costs about £3,000. Advice or assistance from yourself or your readers would be gratefuly received. I mention the ST because it has the advantage (in this case) of having the operating system in ROM and is a versatile machine.

M H Knight, Bolton, Lancs.



• Scan it with Kempston – the best on offer, says Uncle TT.

The Atari ST has a range of hand scanners available which enable direct-digitised copies of pictures and text to be imported into the computer and displayed, resized and manipulated at will. The scanners take the form of a palm-sized piece of plastic with a roller which is connected via an interface to the ST's cartridge port. Capturing text is a simple matter of rolling the scanner over a desired page and watching the image build up on screen. The whole operation takes a few seconds (as long as it takes to roll the scanner over the complete page) and is easy enough for anyone to perform.

Although most scanners provide digital representations of pictures that can at best be described as adequate, ordinary text is a particularly good subject for the scanner and an almost perfect representation can be achieved. So, the question becomes which to buy?

In a recent round up of hand scanners featured in the *Express* sister magazine *ST Format*, the Kempston Daatascan came out on top. This is a mid-priced device (£229) and although it's been around for a couple of years, it has recently received a software overhaul to put it at the forefront of hand scanners. A wide variety of features including the all-important ability to zoom in on a captured image means that for you, the Kempston Daatascan would be ideal. Kempston can be contacted by phoning 0234 855666.

If you would like more information about this or any of the other scanners available for the ST then bung three pounds together with your address and a request for issue 9 to *ST Format* Back Issues Department, The Old Barn, Somerton, Somerset. It will be in return of post.

keyboard but that machine is alas, out of your price range.

Which leaves the PC clone. A mere 400 clams will get you a machine with parallel and serial ports (suitable for printers and mice), a mono monitor and a couple of floppy drives all fitted as standard.

There's an absolutely enormous range of quality software covering the whole price spectrum, and the machine wil be equipped with at least a reasonable keyboard suitable for prolonged typing. Which clone? Have a look at the Amstrad range. Many satisfied buyers have been there before you and although the Amstrad PCs are a little cheap and tacky, they certainly are cheap and perfect for home use.

Oh, and one last piece of advice. Do not, under any circumstances, buy discontinued, knock-down-price, once-in-a-lifetime-bargain, Sinclair PC200s. These machines were an abortive attempt by Amstrad to capture the "I'd like a PC but after having a TI99/4a I'm a little frightened" market. A reasonable plan you might think and you'd be right, except the machine is appaling, was hated by everyone and will soon, I hope, be abandoned by Amstrad. This means that a 1001 box shifters up and down the country will be bunging them out of the door at supposedly 'bargain' prices and this machine, priced at 75p wouldn't be a bargain – believe me! It's a cruel world out there...

HELP! Monitor mayhem!

I have in my possesion a monstrosity of a printer terminal that goes by the name of a Mannesman Tally T1612. Until recently I had this connected to my old Atari 130XE via port 4 of the Atari 850 interface. This machine is, I think, a 20mA loop device with only four connecting wires – these being Xmitted data-, receive data-, Xmitted data+ and receive data+. Now what I would like to know is, is it possible to connect this beast to my Atari 520STE?

Also, recently, I purchased a Tandy CM5 colour monitor for £50 from my local Tandy store. The reason it was so cheap is that it had no packing or instructions and was an ex-display device. The assistant who sold me the monitor assured me (after contacting a more knowledgeable source of information than himself) that the monitor was compatible with the STE. After hours of trying I am still no nearer to getting the monitor to work. Could you please enlighten me as to the right connections or put me in touch with someone who can make the lead for me?
Andy Mills, Stockbridge, Hants.

Connecting the Mannesman Tally shouldn't present any problems. In fact, the lead you used to connect it to your Atari 850 interface should suffice as a connecting lead between the printer and the ST (or am I incorrect in thinking the 850 has a 25 way D connector?). If this lead doesn't work then simply buy a standard serial cable from any of the advertisers in Shopping Express – the price should be around £10.

The monitor can be connected thus: ST monitor pin 13 to CM5 pin 1, ST pin 5 to CM5 pin 4, ST pin 7 to CM5 pin 3, ST pin 10 to CM5 pin 5, ST pin 9 to CM5 pin 8 and ST pin 12 to CM5 pin 9. Simple, huh?

HELP! Emulation

I have decided to buy an Atari 520ST and have been told by a work colleague that it is possible for the ST to be modified using codes or a PC emulator so that it will be compatible with up to 98 per cent of PC software such as *WordPerfect* and *dBASE III Plus*.

If this possible, could you enlighten me on this process and recommend a PC emulator that is available in the public domain?

Also, could you recommend a 5.25-inch disk drive that would be compatible with this machine?
Gordon Watt, Carluke, Lanarkshire.

The Atari ST can indeed be made to emulate the PC using specially written software and add-on hardware. None of this, however, is available from the public domain – it's out with the wallet and handing over the mazuma I'm afraid.

I dealt at some length with the subject of PC emulation on the ST in last week's Tech Tips, and I don't intend to do it again just yet. To receive the pearls of wisdom handed over last week bung 75p with a request for issue 79 to *Express* Back Issues, The Old Barn, Somerton, Somerset and you'll be reading the info quicker than you can thank your old Uncle Techtip.

Several manuafcturers market 5.25-inch drives for the ST, two of the best being the one from Cumana (0483 503121) and the other from Power Computing (0234 273000, which also sells the popular PC emulators, PC Ditto and PC Ditto II). These devices connect directly to the ST's second floppy port and can be accessed and used just as though they were normal 3.5-inch drives.

It's possible to use any old CP/M or PC 5.25-inch floppy drive, meaning that you could buy a second-hand example from a spares shop and fit the thing yourself, but the operation would require the construction of a suitable lead to connect drive to machine. As you're obviously a beginner this may be a little ambitious. If any propective 5.25 user would like details of this, however, feel free to write...

HELP! Curse the cursor!

As my entry into computing I recently bought one of the discontinued Olivetti PC1/HD machines that came onto the market. I was an absolute novice, not even knowing what MS-DOS meant. I soon understood that I would need a general use copy of the system disk that came with the computer.

When I went along to buy a 3.5-inch floppy disk at a local shop that deals only in software and hardware, the salesman offered to copy my system disk there and then and, because I was desperately afraid of corrupting or deleting the master disk, I accepted and had a copy made in the shop.

I have found now that whenever I boot up my copy I get all the usual text running down the left hand of the screen until I reach the a: prompt. At this point the text scrolls up one space, prints a second a: prompt and then the whole text moves one character space to the right. This behaviour now also occurs with the master disk. Has the copying slightly corrupted the disk?

The only practical effect now as far as I can see is that I have a 79 x 25 screen and when I put a coloured rectangle on the screen, the left hand margin is one character space wider than the right hand margin. Is there anything I can do about this situation? Can it be remedied? Or must I accept this, although it niggles me slightly?
David Dixon, Ongar, Essex.

Gosh! You really are a frightened rabbit aren't you? There isn't any need to be so worried about what you may or may not damage. The computer is a hardy beast which wil stand up to a bit of knocking around, and the disks are fairly robust, too. Sure, make a copy of important disks, but don't be afraid to use the originals if necessary.

The screen has moved to the right? I doubt it. When a PC compatible is booted, MS-DOS runs a little automatic batch file (a program which performs series of unconnected actions specified by the user) known as the `AUTOEXEC.BAT` file.

Within this batch file there is a sequence of commands chosen by the user to set up such things as what the prompt should look like, whether the screen should be cleared and so on. It's possible that this batch file has been changed by the person who performed the system disk copy, but that's unlikely because you've said that booting the machine with the original system disk has the same result.

I think that in the initial state of new-owner excitement, you simply haven't noticed what happens at boot up. Now you're convinced that the machine is behaving differently. OK. To put your mind at rest, why don't we create a new boot up batch file which will do exactly as we tell it?

Try this:

```
DIR A:AUTOEXEC.BAT
```

This will determine whether or not there's an existing autoexec.bat. If there is, it wil be displayed on the screen with its size, date of creation and so on. Now type:

```
DEL A:AUTOEXEC.BAT
```

Fine. You've just deleted that all important batch file. Worried? No need to be, for we're about to create a brand spanking new autoexec file. Hack in this:

```
COPY CON AUTOEXEC.BAT
ECHO OFF
CLS
PROMPT $P$G
ECHO HELLO DAVID...
```

Now press the control and 'Z' keys at the same time. You've just created a new `AUTOEXEC.BAT` file. Try this. Perform a three-key re-boot (press control+alt+delete all at once) with the floppy disk containing your new autoexec file still in drive a. When the machine re-boots, the screen will clear, your prompt will change to `A:\>` and the message 'Hello David...' will welcome you to a new computing session.

If you don't want to be greeted thus everytime you re-boot, then don't type the line `echo Hello David...` when you create the batch file. By the way, the addition of the `prompt $p$g` line ensures that MS-DOS informs you of the current directory and path name wherever you may wander.

For example in the root directory, you'll get `A:\>`. But if you have a directory called 'programs' for instance and you enter that directory using the command cd programs, then the system prompt will automatically change to `A:\PROGRAMS>`, thereby acting as a constant reminder of where you are in relation to the root directory (this is necessary, even 'old hands' get lost occasionally).

Sit back, breathe in and out deeply once or twice and approach your new computer with a calm mind. There's nothing to be afraid of and given a little time and experience, you'll be computing with the best of them.

If you continue to need help, cut along to a decent book store and buy a copy of *A Concise Introduction to MS-DOS* by Noel Kantaris published by Bernard Babani and priced at £2.95. This is an excellent beginner's guide to the horrors of DOS, it's friendly and couched in a language which is simple to assimilate.

Good luck...

EXPRESS MAIL

Britain's liveliest computing forum – packed with comment, controversy and conflict. Write and tell us what you think! Reach us at: *Express Mail, 30 Monmouth St., Bath BA1 2AP*
Sorry, no personal replies, even with an sae.
This week's replies written by Keith Pomfret.

Banana DOS 2.2

I have (easily) resisted writing to your little rag in the past, on the grounds that my thoughts were of no importance to the global view.

However, noting the plunge in standard of the letters page, and the cuttingly cruel wit you use to reply (bravo on both counts), I now feel confident to contribute. As a long-standing factory worker I understand the virtue in public humiliation.

My opinions are threefold. Firstly, in *Express* 74 you had the effrontery to draw a comparison between the Atari ST and a banana butty. I'm sorry but this is just beyond the Pale, one expects some schoolboy belittlement, but open disrespect for one of the nation's favourite tea-time snacks is quite unforgivable.

It is also obvious which part of the country you come from (yuppie), you spelled it wrnogly (*sic*).

Secondly, you may be wondering why all this fuss over astrology has blown up lately. I feel it is my duty to point out that both computing and astrology are inextricably linked to the same ruling planet – Uranus.

Its recent and powerful move into Capricorn has lent considerable rationale to both disciplines. What amazes me, though, is that so many of your reporters have already discovered how to beam their stories from it.

Lastly, why is Rod Lawton the only chap who ever mentions the Amstrad CPC in your paper?

Is it perhaps that most CPCers are content in the knowledge that they already use the superior machine, and do not wish to associate themselves with the other rabble you attract? After all, they do have access to the world's greatest computer magazine *Amstrad Action*.

By the way I had a pony on Call Collect, what a shame the Jockey Club chose to put a monkey on it!
Phil Howard, Mapperley, North Wasteland

I put my hand up and apologise for my cruel reference to the banana buttie (*The dictionaries do actually say 'butty' – ed*). I have written to Fyfes for a bunch to review and when they arrive, I'll be doing an in-depth sandwich, or two or three – time willing.

As a Lancastrian Capricorn, I have no wish to know about Uranus even if it is the most disciplined body in the ethereal plane.

Furthermore, we have a system here whereby we ration each writer to a single machine and as Rod occasionally (once a month) edits a little CPC magazine, we let him blather on about Sugar's first computer in *Express* by way of partial payment for his stalwart-type efforts elsewhere.

Change or arrest

I feel I must write in defense of Amiga contacts. I am referring to *Express* 77 titled 'Direct Action'.

Most Amiga contacts swap public domain demos etc, and not commercial software as your reader suggests. The duff-up-and-nick-'em committee does exist.

For example, at a recent vision copy party some French police guys from Titus burst in looking for a 'stolen' program from Titus. They seized all the disks, totally ruined everything and what did they find? Nothing.

Your reader obviously has something to hide or he would have given his name. He only wrote the letter because he's fed up with his ST.

If anyone wants to contact me to swap PD etc, my address is below.
Michael Flanz, 17 Northgate Close Whittlesey, Peterborough PE7 1RB

We have included your name and address but if we hear that you've been naughty, Reggie and the Boys will be down to check your floppies.

P.D.Q.

A PD column at last, yippee! But, come on, you're a weekly, why not mention all the latest programs (including demos)?

Will someone tell Steve Carey to stop doing plugs for *ST Format*. OK, so it happens to be the best ST monthly around, but that's not the point. Every week he uses up valuable space and it's getting tedious.

You seem to have printed a lot of letters recently, politely requesting you not to print letters on the MBY debate (as C Aldridge put it). S'funny as there don't seem to have been letters from over-hyped Amiga/ST owners recently.

The main thing I want to relate is about computer shows. I have been sitting patiently up here in West Yorkshire for a couple of years now waiting for a show to come 'Up North' and yet there have been plenty down in London.

I remember the days when there was a show in Manchester every year specifically for the BBC, Electron and Archimedes; when thousands of people were crammed into two floors, people selling, people buying, people having a mooch.

OK, it was disorganised, squashed, sweaty, the cafe was awful, and goodness knows what would have happened if there had been a fire - but it was all still great fun. Now there's not even an All Formats show.

Come on organisers, there is life north of Watford Electronics, you know. What about people in Manchester, Leeds, Bradford, Newcastle, Preston? So you won't make as much money as down south but you owe it to us (none of this is directed towards *Express*, I'm just letting off steam). I've heard about a Scottish Show – well done whoever organised it! Now what about the north of England?

By the way, I challenge you to find a supplier in your magazine who sells cheap modems (sub-£50). Hardly anywhere sells even expensive modems either, these days.
Steve D Sharples, Harden, Nr Bingley, West Yorks.

To answer your observations in order of their appearance

• Why not indeed. Point taken – I will pass the message on.

• I spoke to young Carey but couldn't get him away from his Apple Mac for long enough to get him to listen.

• One man's meat and all that. Why don't we stop printing letters from people who say no one sells modems any more when they live practically next door to Pace Micro Technologies?

• You need wait no longer. Turn left at the M62 and keep on going until you come to Hull; or, alternatively, turn right and head for the lights at Manchester.

See pages five and six for more details. And for good measure, there's one in Leyland that we reported on a few weeks ago.

• Pace in Bradford make modems from V21 V23 Linnets up to huge ever-so-fast ones that not even Kylie could afford.

Educating Edwards

We wholeheartedly applaud your comments in *Express* 73 regarding a letter written by Darren Edwards, 'Gizza Job', wishing to break into the programming field.

Darren intimated that to be able to afford a course, one would have to be part of an elitist society! Wrong. If a prospective student can prove to us that he/she is hard working and ambitious, we can then offer all the help available.

In Mr Edwards case it does occur to us that he could be eligible for a career development loan. A Computeach course is acceptable under this scheme and, with our training and jobsearch facility, we would be in a very good position to assist him.

If he would like to write to us directly, addressed for my attention, we will be happy to give him full details and any further advice that he may need.
Beverley Parkinson, Dudley, West Midlands

Bravo, Bev. What can I say other than thank you for putting the record straight, and thank you for offering help.

Indeed, more people should find out what's available before applying prejudice to the word 'processor'. I hope that the aforementioned gentleman reads your letter and takes heed. I suspect that he might not, alas.

If anyone is interested in appllying for more details, here is the full ➤

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address: Beverley Parkinson, Public Relations Manager, Computeach International Limited, University House, Jews Lane, Gornal, Dudley, West Midlands DY3 2AH.

Why, oh why...

Why, oh why, do I keep reading 'why, oh why' letters in the computer press about computer viruses? I am convinced that viruses have been sent down from software houses to punish those with immoral life styles – ie the software pirates.

It has been well publicised that viruses were propagated by those people sharing infected disks, and I cannot feel any sympathy towards them.

I do, however, feel sorry for the innocents, whose systems have been unknowingly infected. I think that there are two lessons to be drawn from this: do not share disks unless you have to, but if you do, share with as few people as possible; and, secondly, take all precautions before using a doubtful disk.

Andrew Veitch, Edinburgh, Scotland

It isn't the software houses writing the viruses. From the couple of visits I've taken, the good people are too busy working on the constructive code of the games – not destructive viruses.

Those people writing and spreading viruses are a set of social lepers who have some debatable abilities at programming but don't match it with the common sense that one expects of reasonable adults. They are like the bunch that moved in on CB radio when it first came out, only to clog up the airways with profanity.

Take solace in the fact that these marauders will grow up, go to jail or move on to the next fad that needs the true dedication of a pillock. As for the innocents, can anyone be truly innocent? Did no honest man ever tape a record from the radio or a TV program?

Union rates

My Atari ST1040 died last week. It was two weeks out of guarantee (typical), so I had to look into a repair.

I took it to a repair shop in Tottenham Court Road – 'Completely dead,' he said. I agreed and was quoted a flat rate of £75 – ie £75 minimum charge – 'Could be more,' he said. I was taken aback, so I called Silica and was quoted £74.95 – same situation, flat fee.

I carried my ST back home, took the cover off and found that the internal fuse had blown – replacement cost: £0.27. I'm sure you can imagine how excited I am to have discovered a skill I can sell for £150 per hour.

Roger Marsh, Edgeley Road, London

I'm afraid we'll have to undercut your rates. A straw poll round the office suggests that anything between £140 and £145 an hour would be sufficient for the *Express* Dodgy Fixers PLC.■

Win the mouse with the house

Just the Word

Dozens of exciting prizes are on offer over the next five weeks in our special summer series of Just the Word competitions, beginning this week with the chance to win one of twelve natty Naksha Mouse packs.

The Naksha mouse is a sleek beastie which comes with all the connectors needed to run on an ST, Amiga or Amstrad PC (owners of other IBM-compatibles should not despair but tune in for next week's super serial mouse competition).

The high-resolution (280dpi) device was well received by reviewers everywhere and highly commended for its smoothness of operation and the positive click of its buttons. *ST Format* awarded Naksha's offering a massive 85 per cent review rating, while *Amiga Format* described it as "the number one mouse" for that machine.

The mouse comes complete with its own mat and 'mouse house' for storing it when not in use. It costs a very reasonable £39.95 (£45.95 including VAT), but one could be yours for the cost of a postage stamp if you answer one simple question correctly.

Somewhere in this issue of *Express* – either in the editorial or in an advertisement – is the word FISH. All you have to do is find that word, then go back to the previous sentence and write the final word of that sentence in the space provided on the answer form below.

Fill in your name and address and send your entry to Nakshe Competition, *New Computer Express*, 30 Monmouth Street, Bath BA1 2AP, to arrive not later than Tuesday May 29.

The first twelve correct entries out of the hat will be the winners, and the Editor's decision is final.

NAME .....

ADDRESS .....

.....

.....

The final word in the sentence before the one containing FISH is .....

NEXT WEEK

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An interview with Eric Howe, the man in the know at the Data Registry

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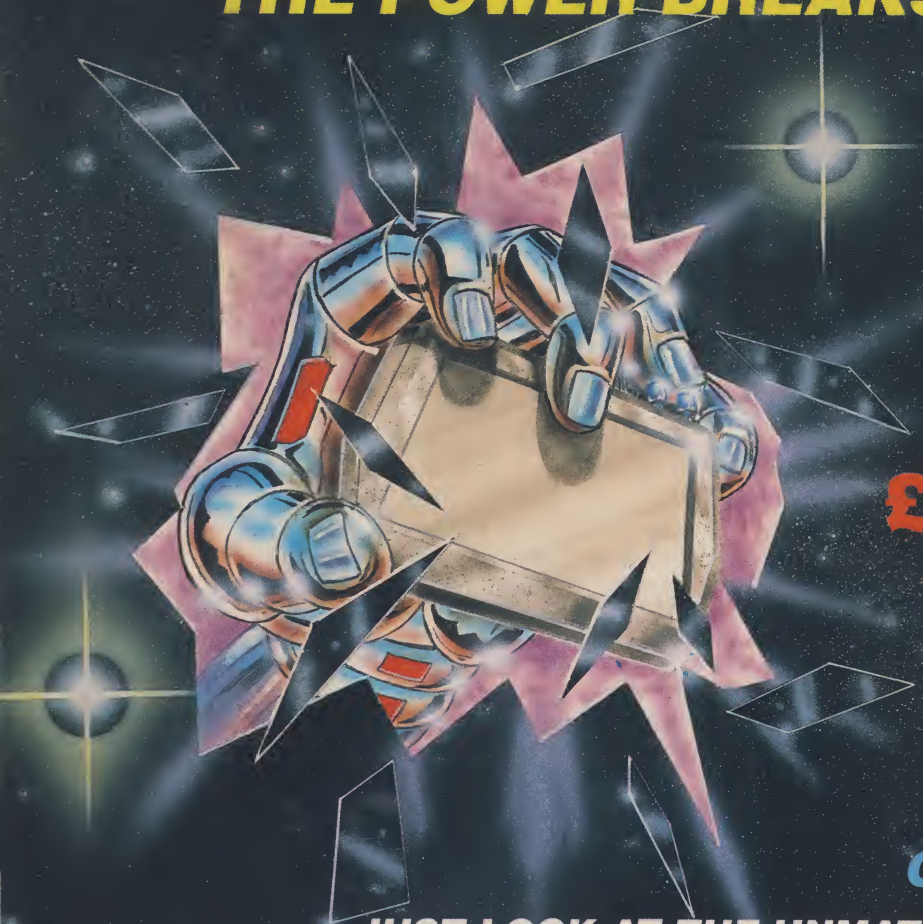

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